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BY

GEORGE THOMAS WHITE PATRICK, PH.D.

PROFESSOR OF PHILOSOPHY IN THE UNIVERSITY OF IOWA;
AUTHOR OF "THE PSYCHOLOGY OF RELAXATION,"
AND "THE WORLD AND ITS MEANING," ETC.

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PREFACE

It is well known that the progress made by psychology in the last fifty years is comparable with the remarkable advance made by physics in the seventeenth century and by biology in the century just passed.

People who think about such things are therefore asking why it is, if psychology has made such wonderful progress, that no one has discovered what the soul is. The question is not so impertinent as it seems. Formerly the biologist said that his science has to do with vital phenomena and is not concerned with the nature of life itself. The physicist said that physics is concerned with matter only so far as it is a carrier of energy, not with its essential nature. And the psychologist said that his science was engaged with mental phenomena and not with the nature of mind. These ultimate problems were rather contemptuously relegated to philosophy.

All this has changed now. The physicist is deeply interested in finding out what matter is and seems about to find out. He is even asking what time is, and whether there is any such thing as simultaneity.

PREFACE

The biologist is investigating the nature of life and hopes to create it. Mathematics and philosophy are in the closest accord, and in general the old landmarks between philosophy and the special sciences are disappearing.

Hence it is not presumption for the psychologist to ask what the mind is, and it is probable that ultimately he will know. In this "search for the soul" there are two movements—one in psychology and one in philosophy—which inspire courage in the attempt to lay the foundations for a future philosophy of mind. Some suggestions toward such a philosophy, intended rather for beginners than for professional students, are contained in these pages.

The first of these two movements is behaviorism, by which I mean nothing more than that the study of the mind has become the study of behavior. The more extreme forms of behaviorism have, to be sure, helped immeasurably in the regeneration of psychology by compelling an inventory of methods and results. The so-called Radical Behaviorists will no doubt themselves resume the study of consciousness, and sanely evaluate the method of experiential observation, or introspection, when they have given the old psychology a sufficient number of shocks.

The second, a movement in philosophy, is the

so-called *organicist* theory of nature, a view closely related to emergent evolution and the theory of levels. The nineteenth century search for elements is giving way to the study of the behavior of organisms, even the electron being regarded as a microcosm. Our attention is turning to unitary complexes and their characteristic activities, rather than to their constituent elements, and if they are composed of elements, the properties of the complexes are nothing like those of the elements composing them, but must be determined experimentally.

Thus evolution becomes creative. Value is not dependent upon origin. A unitary complex might be composed of material atoms—if any such exist—and yet exhibit ideal qualities. It might exhibit new, strange, and unsuspected powers, such even as intelligent behavior, depending not so much on the units composing the complex as upon the relations into which they get—that is, upon structure and organization.

My indebtedness to the pioneer workers in this new field of philosophy will be apparent. The names of some of the more noted of these will be found printed in the references on page 105 in Chapter V. But the full implications of the organicist theory of nature have not yet been recognized. In the pages which follow some of these will be noticed. We shall see, for instance, how this new way of regarding nature redeems

behaviorism from its materialistic reputation, suggesting even a possible affinity with idealism, and how it promises to soften the old antagonisms between materialism and idealism and between mechanism and vitalism, possibly pointing to a coming state of obsolescence of these favorite philosophies.

I wish to thank the editor of the *Scientific Monthly* for permission to reprint in Chapter VII some passages from my article on evolution in that journal of July, 1926.

My grateful thanks are due to my wife, who has assisted in the preparation of this book.

G. T. W. P.

Iowa City.

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WHAT IS THE MIND?

WHAT IS THE MIND?

CHAPTER I

THE STORY OF THE MIND

WHAT is the mind and what is its relation to the body? In this twentieth century we feel quite safe, if we open the right book, in reading the story of the rocks, of the stars, or even of the atoms. We accept it with confidence, trusting the scientists.

But the story of the mind is read with less confidence. We soon find that knowledge in this field is not so far advanced as in the others. Science began with the study of the most distant things, finding the study of the nearest things too difficult. Astronomy was early developed. Psychology has been tardy.

But there is a reason for this, since knowledge becomes difficult as the subject becomes complex. The motions of masses of matter, like stars, are simple phenomena compared with the highly complex facts of human life and mind.

Though a concise and accurate knowledge of the mind has tarried, the discussion of it has never flagged.

WHAT IS THE MIND?

Most primitive people have some theory of the soul. The Greeks philosophized about it endlessly. Every philosopher has speculated about it and every philosophy book has a chapter on it. The story of the mind is puzzling, but it is fascinating. The mind, which knows so much about the stars, the rocks, the chemical elements, the atoms, and the electrons, aspires also to know itself. It wants to know what it is that *knows.* Is this want ever to be satisfied? Will the story of the mind ever be told?

Just recently, say within the last fifty years, an old science has become new. Psychology has come into its own. And philosophy is learning to look at some things in new ways. So it comes about that, whether we may or may not ever solve this riddle of the mind, one thing at least we may say, namely, that in the last fifty years more progress has been made in solving it than in all the centuries since Aristotle. To record some of this progress is the purpose of this book.

When philosophers first began to inquire about the mind, or soul, as it was formerly called, they were of course men in whom the power of speculative thought was highly developed. So it was quite natural that they should emphasize such activities as thought and perception, or that peculiar and highly developed form of awareness which in human beings we call consciousness. The soul, therefore, was to them something

within us that thinks and perceives and is conscious. Furthermore, since from the time of primitive man it was supposed that the soul could leave the body during sleep or at the moment of death, it was inevitable that it should be regarded as some kind of ethereal substance, some shadowy or spiritual stuff. So we find Descartes, the founder of modern philosophy, at the beginning of the seventeenth century defining the soul as a *thinking substance.*

Historical

But perhaps it will be better to go further back than Descartes and recall in the briefest manner some of the theories of the soul from the time of Plato to the beginning of the modern scientific period. Plato, dreamer, idealist, moralist, wrote long dialogues in the beautiful Greek language to penetrate this great mystery—the mystery of the human mind. To this mind Plato gave a fine name. He called it the *psyche* or *soul,* and he thought that it was a kind of divine essence, a reality, imperishable, immortal, imprisoned in the body, fretting to be free and to fly away to its home, but carrying with it fatally the consequences of a good or evil life.

Plato's real theory of the soul was much more elaborate, but it was this part of it, as refined and simplified by Plotinus, the neo-Platonist of Alexandria, which posterity seized upon with such delight. It was easy to

understand; it had poetic beauty; it carried hope; it suggested justice. Through long centuries it has become imbedded in both popular and religious thought and has been made familiar to us all in hymn and story. But modern science has dealt harshly with Plato's theory, consigning it to the realm of myth. How much myth and how much truth it contains perhaps we may see.

There was another great Greek thinker, a contemporary of Plato, who also wrote about the soul. This was Democritus, the materialist, and he said that the soul was not an immortal essence, or any kind of spiritual being, but was of the very stuff of the body, namely, material atoms, composed only of smoother and more nimble atoms than the rest of the body. Posterity shuddered at this doctrine—turned from Democritus to Plato—and modern science has condemned his theory also.

Following Plato and Democritus there was another great thinker who wrote about the soul. Aristotle believed with Plato that the soul is real—more real perhaps than anything else in the world. But Aristotle was less a dreamer and more a student of nature. He studied such commonplace subjects as anatomy and physiology, dissecting animals and the bodies of the dead, and he came to wonder about the relation of body and mind, and finally propounded a wonderful theory,

which seemed to have a scientific as well as a metaphysical and ethical value.

Aristotle said that the soul is the reality of the body. He used the striking word *entelechy,* which means the final reality or perfection of the body. The soul is the function of a living being, not in the sense of what a living being does, but what it can do at its best. The soul is the *fruition* of the body. It is therefore a value, which was to be realized through the body.

Aristotle, like Plato, was not always consistent in his doctrine of the soul. We wonder not at the inconsistency of these early philosophers, but at their strange anticipations of modern views. Sometimes Aristotle speaks of the soul as the organizing principle of the body, or as a kind of vital force, energizing all living things. Sometimes he speaks of three souls, the vegetative, the sensitive, and the rational soul. Concerning the latter he says that the active reason comes from God and is immortal. Perhaps the most striking part of Aristotle's philosophy of mind was his teaching that the soul is the reality or fruition of the body. One can but wonder whether in some such way the materialism of Democritus might be reconciled with the idealism of Plato.

Later Views

During the Middle Ages, the theory which prevailed was not that of Aristotle but that of Plato, as made

definite and concrete in the teachings of Plotinus and St. Augustine. The soul is a spiritual essence, created perhaps with the body, inhabiting it and surviving its dissolution at death. It is thus an immortal being, dwelling in the body, acting upon it, and acted upon by it. Although Aristotle's theory was revived in later scholastic days, still it was the picturesque and easily understood doctrine of Plotinus and St. Augustine that sank into the popular understanding. It needed only the crystal-clear philosophical setting of Descartes to make it the perpetual heritage of modern popular thought. Descartes even went so far as to locate the soul at a definite point in the brain. The soul, thus so definitely pictured as a tiny ethereal or spiritual substance, comes from God. It is something which, in our nursery prayers, the Lord may keep and the Lord may take. It is something, so the psychologists of the period taught, which may have "faculties," such as thought, memory, will and reason, thus, as they supposed, explaining these things.

Later, under the influence of Locke and Hume, there came a revolt against both the theory of the soul substance and the faculty psychology. What took their place was the philosophy of Ideas. We may not know that we have any soul with faculties, but we do know that we have ideas. We certainly have impressions, whenever we look, listen, taste, touch or smell, and

these impressions may be revived in memory as ideas. Finally, these impressions and ideas may be associated in many ways, giving rise to knowledge. Beyond the impressions and ideas we know nothing of any mind or soul. This, as Hume said, is the whole story of the mind. But it was not a very satisfactory story, for the ideas were almost as mystical as was the soul in the older view. Sometimes the mind was said to *have* the ideas, and sometimes the ideas were said to be *in* the mind, stored, so to speak, when not in use, reappearing perhaps in "consciousness."

The Nineteenth Century

The philosophy of Ideas, like the faculty psychology, left a deep impression upon popular thought, but the modern theory of the mind must rest upon more solid foundations. To lay this foundation was the work of the nineteenth century. Before the end of that century the scientific study of the mind was well under way. Rich contributions came from physiological and experimental psychology and these were later supplemented by the fruitful studies in evolutionary, genetic, abnormal, and social psychology.

First it was necessary to gain a thorough and exact knowledge of the nervous system and the special senses. It was inevitable that the study of the nervous system and the brain should lead to an exaggeration of

their relative importance in our understanding of the mind, making it a function of the brain and reviving the materialism of Democritus. Without of course minimizing the primary position of the cerebro-spinal system, later investigations have emphasized the importance of organic conditions in general, of the sympathetic nervous system, of the endocrine glands, and of "the energy influences seething and bubbling in the organism." Perhaps still more important is the new appreciation of the fact that we have to do with organismic situations rather than with physiological functions. The study of the functions of the brain is a physiological, not a psychological, theme. The study of the activities of the organism as a whole in its interactions with its physical environment and its social *milieu* is the theme of psychology.

From these new points of view it is of almost dramatic interest to inquire what then the mind really is. If it is not a function of the nervous system, if it is not a bundle of ideas, if it is not a thinking substance residing in some corner of the brain, if it is not an immortal essence come from God, is it then nothing at all? Is there no mind or soul? Does the appeal made by Plato's doctrine through all the centuries count for nothing?

Whether it be true or not that there is "nothing great in earth but man and nothing great in man but

mind," still it becomes more and more evident that the powers of mind are supreme. Endocrinology, the story of vitamins, the theory of relativity, the weighing of far distant stars, the non-stop flight to Paris are among its recent enterprises. What is it that is doing such mighty things?

CHAPTER II

WHAT IS THE MIND?

By what method has the recent remarkable progress in the science of mind been made? By the method so successfully used in all the natural sciences—that of observation and experiment. Furthermore, in the study of the mind the observation is objective, so that in this respect also psychology takes its place among the other progressive sciences.

The subjective method, that of internal observation or introspection, was the older way of studying the mind. The searcher after the secrets of the soul turned his attention inward and studied introspectively his own mental processes, his emotions, his sensations, his thoughts, his acts of determination, and then perhaps recorded what he observed.

This introspective method was not without its uses. Even now under the name of experiential observation it serves as a valuable auxiliary to the method of objective study. But it must be regarded as mainly auxiliary, since it fails in the fundamental requirement of scientific method in that there is but one observer and one object

of study. Only the objective method will satisfy the critical conditions of modern research. Our observations must be open to all and our conclusions of such a kind that they may be checked and verified. Centuries of study by means of introspection led to no agreement as to the nature of the mind. A half century of objective study has placed psychology among the modern sciences. Every branch of psychology has made astonishing progress through the study of adult behavior, or the behavior of children, abnormal persons and the lower animals.

Therefore we shall reserve the mention of introspection till a later chapter and begin our study just as other sciences do, with facts accessible to all and beyond question real and objective. Such a fact is the living being. Living beings, like birds, fishes, apes, men, are real existing things and may be observed and studied by all who wish. Experiments with them may be repeated and observations verified.

A Realistic Approach

Just here, however, and before we go on, a possible objection may be noticed. Some devotee of epistemological accuracy may say that a living being is not an ultimate reality. It is not an immediate object of knowledge but only a bundle of "sense data," themselves dependent upon the mind of the observer and

perhaps existing only in his mind. If, for instance, it is a faithful dog that we are observing, we do not know that the dog really exists, for he may be only a bundle of our own sensations. We must first determine, it may be said, the relation of the mind to objective things before we can be sure of the reality of any objective thing, such as a living organism.

But it will be best for us to refuse to become involved in these epistemological quicksands. In beginning our study of the mind with the living organism, we begin just where the biological sciences begin and our results will have the same validity as theirs. We shall be quite content to take the living organism for granted, just as the anatomist or physiologist does, "permitting ourselves," in the words of one writer, "cheerfully to be classed among the scientists, the poets, the religious teachers, and the practical men generally." This method has justified itself long ago by its results.

Since we have used the word *behavior* in connection with the objective study of the mind, someone will certainly ask whether the modern view is the one popularly known as behaviorism. In a later chapter we shall examine the several meanings of the term. Here it is only necessary to say that the objective study of the mind is necessarily the study of behavior. The view which we shall try to make clear in this chapter

is therefore behavioristic. Only in subsequent chapters, when we find it necessary to inquire into the meaning of the word *consciousness* and into the nature of human and animal *interests,* shall we discover the limitations of that theory of mind known as radical behaviorism.

What Is Included in a Complete Scientific Description of a Living Being?

Suppose, then, that we should become interested in some living being, say a horse, a faithful dog, a human friend, and should wish to gain an exhaustive scientific knowledge of him, or make a complete scientific description of him. We should turn perhaps first to the science of animal morphology to learn all about the structure of the organism. This knowledge we should supplement by the study of its microscopic structure, including the ultimate living cells of which the body is composed, histology being here our guide. But it is not enough to know about the structure of the body; we must study also the functions of its various parts and organs, directed here by physiology. Even the science of mechanics would be useful in helping us to understand such things as the pull of the muscles upon the bones. Chemistry, also, especially physiological chemistry, would enlighten us about the many forms of molecular interchange in the organs and tissues.

Even then, however, our description of the living

body would be incomplete, for we learn that such a body can assimilate food, can grow and can reproduce itself. So we turn to the general science of biology to learn about all these things, to learn how a living body can maintain its inner economy, how the species to which the animal belongs can perpetuate itself, and how its historical development has taken place.

But now, after we have studied the living organism in all these ways, after we have learned all that we can about it from physiology, animal morphology, physiological chemistry, and general biology, our description of it would not yet be complete. Something very important still remains, and this something which remains is the activity of the organism as a whole in reference to its environment, both physical and social. Certainly we could have no complete description of a living being if we omitted to make note of *what it is doing,* as it explores and manipulates its surrounding world, as it adjusts itself and responds to its environment, as it meets and overcomes its difficulties, as it mingles with other members of its group, communicates with them and joins with them in social enterprise.

Resourcefulness of the Chimpanzee

Since it is very important to understand just what kind of facts are left over, after we learn all we can

about a living being from the sciences of mechanics, chemistry, animal morphology, physiology and general biology, let us take an illustration, and we will take our illustration from the lower animals, where the situation will be simple and easy to understand.

The German psychologist, Köhler, has written an interesting book recording his observations and experiment upon apes.[1] A chimpanzee, for instance, was confined in a cage having bars in front. On the ground in front of the cage, but quite too far away for the ape to reach, was a bunch of fruit. About two metres to the right of the fruit and nearer to the cage, but not near enough to be reached by the animal with his arms, was a long stick. Within the cage was a short stick, too short to reach the fruit when used as a tool by the ape. An unmistakable desire [2] for the fruit was shown by the animal, indicated by his restlessness and his anxious glances at the food, but he could not reach it with his hand nor with the short stick. Finally his eye rested upon the longer stick.

[1] *The Mentality of Apes,* by Wolfgang Köhler. New York, 1926.

[2] On the question as to whether in an objective study such as this we have the right to use the words desire, interest, or anxiety, consult W. Köhler, *Psychologies of 1925,* p. 153. He discusses and justifies the use of the word *interest* in connection with apes. The use of such words does not assume anything like consciousness in the ape. There is no other word so apt in the description of the behavior of the ape as the word interest. If the observer had never himself experienced desire or interest, he would nevertheless need *some* word to describe the behavior of the ape in question.

With the short stick he could reach this and draw it to the cage. But no sooner was the longer stick in his possession than he dropped the short one and with the longer drew the fruit to the cage. The chimpanzee had solved the problem. He had shown that he possessed the quality of *resourcefulness.*

Evidently in this problem-solving or resourcefulness of living beings we have a new and interesting phenomenon, the description of which does not belong to any of the sciences mentioned. It is an illustration of a class of facts quite as important for a complete understanding of a living being as the digestion and assimilation of food or any physiological function. If the observer, instead of studying a chimpanzee, had been studying a human being, the fact of resourcefulness would of course be immeasurably more in evidence, extending to the solving of the most difficult problems, such as bridging a high and deep river, finding the cause and cure of microbic diseases, or navigating the ocean or the air.

In order then to get a complete scientific description of a living being we must study his activities, his conduct, his perception of the environment, his interest in it, and his reaction to it. These are all objective phenomena, which may be observed and studied quite as well as the structure of the body, or the functions of its organs.

Behavior

Now the study of such facts as these constitutes the science of psychology, which we may define provisionally as the science which deals with the intercourse of living beings with their environment and with one another, their interest in the surrounding world and their reaction to it, their behavior.[1] A living being is an organic whole, a unit, an individual, and the kind of activity studied in psychology is the activity of the organism as a whole, as a unit.

Thus we see that psychology is a distinct science, having its own peculiar province and dealing with a real and special order of facts, and that it is not to be confused with physiology, which deals with the functions of the various organs of the body in their relations to its inner economy.

If we accept provisionally such a very general definition of psychology as this, it is evident that it will include the study of a wide range of activities. It will include all instinctive and habitual movements and even the simplest elements of these, such as any response to any stimulus. It will include apparently all the instinctive drives, impulses, and interests of living

[1] The term *behavior* has been generally adopted as a technical term indicating the activities of a living being such as we have described. This is a useful word and may be freely employed without the implication of any theory of the mind held by any school of behaviorists.

beings so far as these relate to the environment. It will include all kinds of adaptive behavior, from the simple case of resourcefulness illustrated in the chimpanzee to the most complicated exhibitions of human intelligence. It will include the vast field of the intellectual, emotional, and volitional life of the human individual, as he adjusts himself to his material and social environment.

This inclusive use of the word psychology will perhaps introduce a difficulty. It may be objected that this is not what is commonly meant by psychology, which is sometimes defined as the science of mental states and processes, such for instance as thinking, feeling, willing, remembering, forgetting, loving, hating, planning, reasoning. It is of course quite true that psychology studies these things, and being intimate and familiar forms of human attitudes, they tend to absorb our interest. But they do not exhaust the classes of things studied in psychology, for these include also habits and instincts, impulses and interests, resourcefulness and intelligence. All these, like thinking, remembering, loving and hating, are forms of behavior of living beings, modes of reference of some subject to some object. They are attitudes of an individual toward his environment or toward his fellow beings.

Much the same could be said in answer to the objection that psychology is concerned with facts of con-

sciousness, conscious thinking, willing, remembering. If psychology were to be so defined as to limit its field to the responses accompanied by that peculiar kind of awareness which we call consciousness, why, then some other name would have to be applied to the vast field of unconscious activities of men and animals as they adjust themselves and adapt themselves to their physical and social environment. As a matter of fact, psychology is not in modern times confined to the field of conscious activity, as will be evident if we recall the vital contributions to this science made by the behaviorists, the Freudians, and the students of abnormal, genetic, and animal psychology.

Behavior Is Preferential

So we come back to our provisional definition of psychology as the science which studies the activities of living individuals as they adjust themselves to their environment,[1] freely agreeing that we are using the term in its broadest sense. But as soon as we begin to study such behavior of organisms, we discover that it is of a peculiar kind. A common characteristic belongs to all such behavior and this characteristic

[1] "Psychology is the science which deals with the facts and events growing out of the interaction between a creature and its environment by means of receptors, nervous system, and effectors." Howard C. Warren in his *Elements of Human Psychology* (a typical modern text in psychology), p. 5.

is that it is normally in the direction of the *maintenance* or promotion of the life of the organism. Living beings seek to maintain their dynamic equilibrium. They seek food, avoid danger, and favor relations which conduce to the life of the individual and the perpetuation of the species. When organisms adjust themselves to their environment, the adjustment is of a different kind from that of a windmill adjusting itself to the wind. In the case of the organism there is an *optimum* relation between the organism and its environment. Some situations are *preferred* to others, are *better* and *more satisfactory,* and this implies that they conduce to some end, this end being the maintenance and promotion of the life of the individual or of the species. Living bodies, therefore, strive toward a goal. Their activities are, as we say, purposive.

The word *purposive,* however, must not here be understood to imply the presence of a clearly defined end and a deliberate striving thereto, as in the case of human purpose. It is quite sufficient for our present task to record merely the preferential character of the behavior of living bodies as a fact open to any observer, it being quite unnecessary for us to assume any teleological theory of nature or to take sides in any philosophical interpretation of this fact, whether vitalistic, animistic, behavioristic or mechanistic.

It is very clear that organisms have interests and

preferences, that some things such as food are good for them, conducing to the maintenance of life, that other things such as waste products are not good for them, and that still other things are dangerous. Organisms strive to get into satisfactory relations with their environment. They strive to avoid dangers, to obtain food, to get rid of waste products. It is the most familiar of facts that the actions of human beings are of such a kind as to satisfy some impulse or desire, in some way to promote their well-being and their mental or social integrity, to preserve their dignity or their rights, or to win their happiness or the happiness of their families, friends, or social groups.

Thus we see that the field of psychology becomes more definite. It deals with the behavior of living beings as they adjust themselves to their environment in such a way as to conduce to their welfare. When the amœba exhibits a restlessness which reminds us of hunger, moves about among surrounding objects, somehow sensing them, retreats from those that are dangerous and absorbs those which are fitted for food, we have a living organism adjusting itself to its environment in a way conducive to its welfare. When the chimpanzee exhibits resourcefulness in devising means for drawing the fruit to its cage, we have a living body adjusting itself to its surroundings in such a way as to satisfy its interests. When a man analyzes a new

situation and by ideational construction solves his problem, we have again a living being adjusting itself to its surroundings in a way to satisfy some interest or desire.

Provisional Definitions

Since, then, we have a clearly defined class of natural events constituting the subject matter of psychology, we shall need a name to denote these events. Just as the biologist uses the term *vital* to denote the processes studied in his science, such as growth and assimilation, so we may use the term *psychical* or *mental* to denote the processes and events studied in psychology. And just as the biologist uses the word *life* to denote the totality of vital processes, so we may use the term *soul* or *mind* to denote the totality of psychical or mental processes.

Thus we seem already to have arrived at a definition of mind as the sum total of those processes and activities studied in psychology, and to have given to these a definite meaning in defining them as the behavior of living beings as they adjust themselves to their surroundings in such a way as to maintain their integrity and satisfy their desires. Let us, however, regard this definition of mind as provisional rather than final. It would probably have to be restricted in some directions and enlarged in others. It seems, at any rate, to promise a great simplification of the ancient problem of

mind, freeing it from much ambiguity and mysticism. It assumes nothing but the presence of living bodies behaving as we observe living bodies to behave.

It may be objected, however, and not without reason, that in defining mind in this way, we are using the term too broadly and departing too far from common usage. We might be justified in applying the term *psychical* to all these forms of behavior, since they obviously belong to psychology, but not the term *mental,* which in common usage has a more restricted meaning. When the woodsman, desiring food, invents a trap to catch an animal, we have no hesitation in calling the process by which he achieves his end a mental process. When a chimpanzee devises a means for reaching the fruit by using a short stick to secure a longer stick, we say that he shows intelligence and probably should not object to applying the term mental to the process. When a school of little fish rushes toward a handful of sawdust thrown upon the water but after a number of repetitions of the experiment pays no attention to it, we say that the fish have learned from experience, and the ability to learn from experience we consider to be the mark of intelligence, if not of mind. But when an amœba, exploring his surroundings, discriminates between objects that are dangerous and those fitted for food, we hesitate perhaps to say that its action is mental.

Again, when we observe the movement of a bird building its complicated nest, feeding and rearing its young, or the even more wonderful conduct of certain species of insects, we may be reluctant to say that their operations are mental and prefer to use the word instinctive. Finally in the case of simple reflex actions and of tropisms we decide that the term mental is inappropriate. In all these instances, however, we have living beings adjusting themselves in a way to further their well-being, and in all of them the actions are purposive in the sense in which we have used this term.

Intelligence

Thus it begins to appear that what we have in fact is a developmental series from the simplest form of reflex action to the most complex behavior of a human being and that it is largely a matter of usage or individual preference at what stage of the development we begin to apply the word mind or mental. It is owing to the indefiniteness of these words that psychologists are now using them less and are adopting more technical terms with more definite meaning. Intelligence, for instance, is such a term. A quite definite meaning has already been given to the word intelligence and great progress has been made not only in measuring it but in understanding it. Whether we may or

may not ever know what the mind is, we are coming to know somewhat definitely what intelligence is, and intelligence is certainly a typical mental process.

The nature of intelligence can best be understood by approaching the subject genetically, noticing first the simplest forms of activity in animal organisms. Every organism is affected through its receptors by various forms of energy in the environment and through its effectors responds to these stimuli by various reactions, the reactions being normally such as to conduce to the welfare of the organism or its species. The very simplest form of behavior is therefore a response to a stimulus. The nervous system is essentially a response mechanism. Later we shall see that even the simplest organism is something more than a response mechanism, but for the moment it will be useful to consider it in this way. Quite reflexly the eye closes when a threatening object approaches, and the hand or foot is withdrawn from a painful stimulus.

Once, in a zoological garden, I remember watching a gray wolf in a cage. When I started away he jumped after me as far as the bars would permit. When I turned about, he slunk back. This I found was repeated without variation as long as I continued the experiment. This conduct, serviceable no doubt

to wolves, had become mechanized through the ages in the action-patterns of the wolf's brain and we call it instinctive. Such conduct takes infinite forms in animal life, some of them so complex as to evoke our wonder and admiration, as for instance among the hymenoptera. A given situation is followed by a given series of muscular reactions and the animal shows little power of adaptability to new and unwonted circumstances. It is just with the beginning of such adaptability that we see the dawn of intelligence. We wonder at the marvellous "cunning" of the Baltimore oriole, constructing its hanging nest concealed so "skilfully" by the leaves. Really, however, there is little cunning or skill. What we have is a series of stimuli consisting of the warmth and light of the spring days, the visual perception of the trees and environment, and the reproductive urge in the bird itself, followed rather mechanically by the complicated movements requisite to nest building. Some slight degree of adaptability there may be.

In the evolution of living beings, there comes a time when just this power of adaptability arises, marking the dawn of intelligence, marking, as some would say, the dawn of mind. In the cortex of the human brain, for instance, there are nearly ten thousand million cells so related through their synapses that the number of possible connections or patterns is beyond

any kind of numerical computation. With such an equipment it is not strange that the intricate processes involved in intelligence become possible.

If we return again to the case of the ape in the experiments of Köhler, we may witness the beginning of this new mental power. The animal sees the food and would grasp it instinctively. But it is beyond his reach and he is baffled. In securing the long stick by which he may draw the food to his cage, he is meeting a new situation by a new set of movements. There is some delay of the old instinctive reactions, some dawning analysis of the situation, some traces of a plan, some use of his past experience in solving a problem.

When instinctive or habitual responses are delayed as not appropriate to some new situation and a new response is ventured, better adapted to the circumstances, then intelligence has arisen. Intelligence has been defined as the "capacity to improve upon native tendency in the light of past experience." Intelligence is the regulation of behavior.

When a living being is confronted by a new situation in which old instinctive or habitual responses do not suffice, when trouble and perplexity arise, then if the individual can readjust his actions, adapting them to the new situation, we say that intelligence is present.

Circumstances are controlled to the end of successful adjustment in spite of obstacles and difficulties. Intelligence is the redirection of conduct in circumstances where habit and instinct are insufficient. Intelligence is a new power which living beings acquire as the result of a higher degree of organization and integration in the central nervous system.

We have seen that intelligence is a kind of adaptive behavior. Even in reflex and instinctive movements organisms *adjust* themselves to their surroundings, but their power of adaptation to new and unusual situations is slight. The adjustment is instinctive, that is, it is predetermined by the structure of the nervous system. When intelligence arises, the response is no longer predetermined but it is more or less deliberately and reflectively controlled to bring about a desired end. Intelligent behavior when fully developed involves many factors which we call mental factors, such as memory, reflection, analysis, imagination, thought, reasoning. All these, however, like the other mental qualities which we have studied are forms of activity of living beings. Thinking, remembering, imagining, as exhibited in higher forms of intelligence, are only what human beings are *doing* under appropriate circumstances. They are not qualities or exhibitions of mind. We do not think and remember and imagine

because we have minds. We have minds because we think and remember and imagine.

The whole philosophy of mind is greatly simplified when we understand that all intelligence is intelligent behavior and that in intelligent behavior we have a living organism actuated by certain impulses, desires, and urges, acted upon by certain stimuli in the surrounding world and reacting to those stimuli in a way to maintain the life and integrity of the individual. The reactions may be overt or covert, explicit or implicit; they may be muscular or glandular, but they are still reactions. The actions of the chimpanzee as he devises means of drawing the fruit to the cage are reactions in which the hunger of the ape and the sight of the food and the sticks are the initial factors. The achievements in devising means of securing the food are not exhibitions of intelligence. Intelligence is a name which we give to that kind of achievement.

The Beginnings of Adaptation of Response to New Conditions

This will become clearer if we notice the steps in the development of intelligence and some of the specific forms of activity involved in the higher mental processes in man. Let us go back to a simple instinctive movement. A newborn chick pecks at a grain of sand or food placed before it on the ground. It is

a case of stimulus and response. But if we take a grown fowl and place food before it on the other side of a fence, its action is different. It will press reflexly toward the food, but meeting the obstruction, it will no longer press directly forward but flutter back and forth with random movements. It will pursue the trial and error method. Perhaps it will find a hole in the fence and reach the food; perhaps it will find no hole, and remain hungry. But it will try to do something. Its behavior is thus very different from that of the iron filings drawn toward a magnet and meeting an obstruction. The iron filings simply come to rest against the barrier. Not rest but restlessness characterizes the living organism.

Not only does the organism use the trial and error method, but if not too low down in the evolutionary scale, it behaves differently after each trial. Its reaction is not a function of the internal hunger stimulus plus the external sight-of-the-food stimulus, but a function of both these and the enregistered results of previous reactions, that is, the acquired neural pattern. In the case of the caged cats, the cat will try to get out by every sort of random movement until the happy combination is found. And then the interesting thing is that when the experiment is repeated, although she still appears to use random movements, she will get out a little more quickly with each repe-

tition of the test. The elements of the learning process have appeared.

Trial and error therefore form a kind of intermediate step between instinctive and intelligent behavior. Trial and success would be a better phrase. Success means bringing the organism into a relation with the environment characterized by the attainment of some goal and an accompanying satisfaction. The trials connected with success are enregistered [1] and the process is thereby short-circuited the next time.

There is another way in which instinctive behavior is modified and the learning process promoted. Since this again is a case of individual adaptation of response to new conditions, it marks also the beginning of intelligence and the appearance of mind. It is when a conditioned reflex takes the place of a simple reflex. When a certain response follows regularly upon a certain stimulus, the same response may follow upon some other stimulus which has often been associated with the regular given stimulus. A hungry dog's mouth waters when he smells a piece of meat. The flow of saliva is the preparatory step in the digestive process. But now his mouth waters when he merely *sees* the

[1] That is, enregistered by their recency, the last trials being the ones connected with success. But there is some doubt about the mechanism of the trial and error method of learning. By some it is considered a case of negative conditioning.

food. Further still Pavlov found that if a bell were struck repeatedly when the dog was shown the food, then finally his mouth watered whenever the bell was struck, even when no food was shown.

A moment's thought will reveal the possibilities of the conditioned reflex in the development of mind. It would for instance be of enormous advantage to an animal to respond, and to have formed the habit of responding, not merely to the presence of an enemy, but to any *sign* of him, a certain sound, a movement of the shrubbery, a track in the sand—to anything that has been associated with the presence of the enemy himself. The rôle of the conditioned reflex is of unlimited significance, as we can understand if we think of the important part played by signs, symbols, language and meanings in our mental life, and the habit reactions connected therewith. If the neural mechanism of the conditioned reflex is not fully understood, no one acquainted with the microscopic structure of the cortex of the brain with its millions and billions of potential branching connections will wonder at its possibility.

Implicit Responses

But now we must go on to consider a new power which arises in living organisms, marking a still greater step in the growth of intelligence and of mind. The hen trying to get through the fence to reach her food

actually goes through the bodily movements of the several trials. Her conduct is, as we say, overt. But suppose with the development of the nervous system and its manifold potential patterns it were possible to abbreviate the trials, to begin the movements but not to finish them, unless very promising of success, then great time might be saved in the trial and error process. In this case *implicit* responses begin to take the place of explicit ones. Such responses are no longer overt but covert—or incipient.

Using more psychological terms, such processes are called *ideational*. The idea takes the place of the outer muscular movement, and with the coming of the idea a new level has been gained in the development of intelligence. Learning by the trial and error method is enormously facilitated when the trial and error are no longer overt, when they are abbreviated on the level of ideas.

An illustration will make this plainer. Let us take another of Köhler's experiments. One metre from the wall of a house, he fenced off a small enclosure, or pen, two metres square, thus making an alley between the enclosure and the house. This was made a blind alley by means of a grating at one end. An animal placed in the alley and seeking food on the other side of the grating could get the food simply by turning about and going around the enclosure, and this pos-

sibility was made more evident by the fact that the enclosure was of open work, so that the animal could see through it. In the blind alley Köhler placed some hens, and outside the grating he placed some food. Instinctively they started toward the food but were stopped by the barrier. Then they fluttered back and forth and rarely by the trial and error method found their way around the enclosure. Next he put a hungry dog in the alley with food beyond the grating. The dog started toward the food, was stopped by the barrier, then turned at an angle of 180° and ran around the fence. In other cases when food was placed very close to the dog's nose, but beyond the grating, he simply pressed toward it unavailingly. Finally, a little girl, one and a quarter years old, who had recently learned to walk, was placed in the alley and an attractive toy put beyond the grating. She also instinctively reached forward for the object but was stopped by the barrier. Then something different happened. She turned slowly around and surveyed the situation. Suddenly her face lighted up and she was off around the fence to the goal.

In the above experiments the dog's solution of the problem marks that stage in the development of intelligence when by the trial and error method repetition shortens the road to success. He had been in such situations before. But the case of the little girl is dif-

ferent. She had a better brain and could think the simple problem through. But this does not mean that she did not pursue the trial and error method. It only means that the trials and their results are short-circuited in imagination, that the learning process is enormously abbreviated in ideational behavior. The hen must actually go through with all the trials. The little girl tried the various solutions quickly in "a flash of thought," and with a smile of glee saw the right one. Her action was intelligent.

If we may suppose that a man were placed in the alley with some desired object beyond the grating, it is certain that he would not even reach toward the object. He has learned to inhibit completely his instinctive movements when useless. His motions would all be incipient and unperceived by another observer. In other words, he would "think" about the situation. He would weigh the advantages of coming to the goal by climbing the barrier, by lifting it aside, by breaking it with his foot, or by going around the enclosure. But it would all be done so quickly, as swift as thought, that his final action would seem to be immediate.

Thinking

In harder problems the method is much the same. A traveler comes to a river which he wishes to cross. He might fling himself into the water, and finding it

too deep or swift, retreat. He might seize any object at hand and throw it on the river to serve as a bridge or boat. But being a man he does nothing overtly, except with his eyes. Ideationally he does much. He surveys the situation and reflects upon it. He thinks. Then he solves the problem. Perhaps the river is to be crossed by armies of motor cars and heavy trucks. Then the solution is worked out "mentally" in an office in some distant building.

> To think or to reflect means to postpone response to a given problematic situation until the possible consequences of the possible responses have been mentally traced out. Instead of *actually* making every response that occurs to us, we make all of them *imaginatively.* Instead of consuming time and energy in physical trial and error, we go through the process of mental trial and error. We make no response at all in action until we have surveyed all the possibilities of action and their possible consequences. And when we do make a response we make it on the basis of those foreseen consequences.[1]

Intelligence is defined, according to this point of view, as the capacity to live a trial-and-error

[1] Irwin Edman. *Human Traits and Their Social Significance,* Houghton Mifflin Company, p. 49.

> existence with alternatives that are as yet only incomplete conduct. To think is to cut and try with alternatives that are not yet fully formed into behavior.[1]

So it begins to be clear to us what thinking is, what reflection is—indeed, what the mind is. In all these, a living being is *doing* something. An organism is essentially an active thing and thought is one of its modes of activity. Thinking is "an activity by which we adjust ourselves to those aspects of the environment which are not immediately apprehended in sensation," [2] and thinking becomes possible with the increasing complexity and integration of the nervous system.

> The exercise of thought requires numerous association paths, which are more numerous according as it is more fertile, linking up, with various relay elements and shunts, the receptive stations, the incito-motor stations, and their co-ordination centres, and, in particular, linking the numerous agents of these stations in an infinite number of ways.[3]

[1] L. L. Thurstone, *The Nature of Intelligence,* Harcourt, Brace and Company, p. xv.

[2] C. I. Lewis, *The Pragmatic Element in Knowledge, Univ. Cal. Pub. in Phil.,* Vol. VI, No. 3, p. 217.

[3] Henri Piéron, *Thought and the Brain,* Harcourt, Brace and Company, p. 22.

In the case of the simplest organisms all activity is overt, explicit, outward. As the nervous system develops, actions become more and more incipient, implicit and inward. They are motor responses, to be sure, but partial, incomplete, or central. Images, ideas, thoughts are no exception to the rule. They are not things *in* the mind but modes of behavior which we call mental.

We are hampered in our understanding of this by traditional figures of speech based on notions of mind now outgrown. When a man is reflecting upon possible ways of crossing a river, we say that the various plans "go through" his mind, as if the latter were some kind of receptacle in which ideas are contained. And the ideas themselves are sometimes regarded as entities or units of psychic stuff, as when we say I have an idea in my mind.

Even until recent times the notion that images are such psychic entities has persisted. But Dewey has put the matter clearly when he says that,

> Images are not made of psychical stuff. They are qualities of *partial* organic behaviors, which are their "stuff." They are partial because not fully geared to extero-ceptor and muscular activities, and hence not complete and overt.[1]

[1] *Experience and Nature,* The Open Court Pub. Co., p. 291.

If we keep in mind the fact that in human adult life our reactions become more and more implicit, more and more partial, inward, central, even glandular and visceral, we shall be able better to understand the nature not only of images but of thinking, remembering, feeling, and the like. As regards thinking, we should also recall the supreme importance of language in all thought processes. When living beings first acquired the art of speech, the development of mind took a sudden jump—a very big jump. The short-circuiting process was vastly extended. The dealings of organisms began to be with symbols and meanings. The spoken word became a most efficient tool.

The word, indeed, could be applied not only to individual things but to a whole class of things, or to a class of classes. With the use of abstract terms thinking advanced ever more rapidly. Furthermore, it was not necessary that the word should be actually spoken. It could be whispered. It was not necessary that it should even be whispered. Incipient movements of the tongue and lips or slight innervations of the vocal cord were all that was necessary. Much of our thinking is thus subvocal response. Given the invention of language, words instead of things, word-images instead of words, and the human mind places instantly a vast interval between itself and the mind of infrahuman species, for with this equipment man becomes the

thinker. Language also enables its possessors to participate in the great stores of knowledge and tradition of the present and past.

Finally

It would seem from the foregoing that the ancient problem of mind has been greatly simplified through the approach made by the psychology of the twentieth century. If we may regard psychology as the science of behavior, and if the mind is the name of that kind of behavior by which living beings adjust themselves and adapt themselves to their physical and social environment, why, then, many problems hitherto perplexing and disturbing become easy of solution. The mind-body problem, for instance, which has puzzled many thinkers in many ages, seems suddenly to have disappeared, for we no longer have to ask how body and mind are related, since we now see that the mind is simply the sum of a class of activities of a living being. Still more is the simplification seen in the fact that there is no longer any necessity for introducing some mysterious entity, substance, or subject known as the metaphysical soul or mind, for we now discover that the mind is not a kind of *being* but a kind of *doing*. The present view also places psychology among the natural sciences with its own definite field and subject to all scientific rules of observation and procedure. The

activities of living beings may be studied objectively just as we study the structure or the function of their parts.

And yet the new view of the mind as outlined above leaves many problems unanswered. Some of these press for solution and must be considered. Among these new problems perhaps this one will be the most pressing. How does the view which we have outlined in this chapter affect the *reality* of the mind? What bearing does it have upon the dignity and worth of the soul? Was the soul as conceived by Plato or by Descartes more real than the soul as now conceived? In a later chapter we shall try to answer this question.

Another problem that will confront us is this: If intelligence is a form of activity of living beings, how have they acquired this capacity? In succeeding chapters we must study the evolution of mind in connection with the general subject of evolution. Is the human mind a kind of special creation, or has it been evolved from the simple responses of the lower organisms? It is at any rate very certain that we cannot understand the mind unless we know something of its origin and growth.

Again, although we have attempted to define what the mind is, we have failed to say anything about consciousness. Is there then no consciousness, or is it the same as mind? This question must also be considered.

Finally, we have referred again and again to the fact that living beings have interests, impulses, and instinctive strivings. There is something which impels. What are the springs of conduct? What are the "wishes"? Can these, too, be considered as forms of behavior or must we seek an altogether different source for them?

Although in this chapter it has appeared that mind in its narrower and customary meaning is a kind of behavior, thus simplifying immensely our whole problem of mind, yet evidently there are serious and perplexing questions still to answer.

CHAPTER III

CONSCIOUSNESS

In the preceding chapter we have portrayed the meaning of mind without much reference to consciousness. Indeed, we have seldom used the word, nor found it necessary to do so. And yet we have arrived at a fair understanding of what the mind is, for we have learned that it is the name of a certain class of activities of living beings, such as thinking, reflecting, planning, deciding, remembering, imagining and reasoning. Furthermore, we have found that all these are activities by which living beings adjust themselves and adapt themselves to their environment, particularly those by which they adapt themselves to new situations by means of memory and imagination.

To be sure, we have constantly kept before us that this adaptive behavior, even in its widest sense as memory, reflection, ideational construction and reasoning, does not exhaust the meaning of mind, for those interests, impulses and strivings which belong to all living beings seem also to be included under the term. In another chapter we have still to study these deep

springs of conduct. Without some reference to the interests and satisfactions of living beings, we found it impossible to describe the mind, but so far as consciousness is concerned we appear thus far to be able to give a description of mind without it.

Shall we then, following the example of some of the behaviorists, ignore consciousness altogether and complete our task without the mention of it at all? It would seem that we cannot do this, because the word *consciousness* is in daily use and presumably means something, and to find out what it means is a task that we cannot avoid. And although it may be true that behaviorism may give a very good account of mind without reference to consciousness, still the average man persists in asking what the word means.

The Growing Disuse of the Word Consciousness

But first we must notice that it is not merely the behaviorists who slight the use of the word. Twenty years ago it appeared constantly on the pages of textbooks of psychology. This science was indeed commonly defined as the science of consciousness or the science of conscious states. It is rarely so defined now, and throughout the pages of psychological texts and writings the word appears less and less frequently. McDougall speaks of the havoc wrought in psychology

by the word consciousness and calls it "a thoroughly bad word," [1] and Bertrand Russell, in his *Analysis of Mind*, has this to say: "It is therefore natural to suppose that, whatever may be the correct definition of 'consciousness,' 'consciousness' is not the essence of life or mind. In the following lectures, accordingly, this term will disappear until we have dealt with words, when it will reëmerge as mainly a trivial and unimportant outcome of linguistic habits." [2] Finally Dorsey says that when psychology is divorced from *psyche* we shall be able to throw the word "consciousness" into the discard.[3]

Still further, in the Freudian psychology, the field of consciousness is extremely limited, and the Freudian psychology, weighted as it is with errors and exaggerations, nevertheless is a significant movement in modern thought and has exerted the widest influence. Psychology, to the Freudians, has quite another task than to study consciousness or conscious states and processes. To them the really significant things of mind lie below the threshold of consciousness in the vast and fertile field of the unconscious.

All these facts taken together might seem at first sight to point to the gradual disappearance of the word

[1] William McDougall, *Outline of Psychology*, p. 16.
[2] *The Analysis of Mind*, p. 40.
[3] George A. Dorsey, *Why We Behave Like Human Beings*, p. 333.

consciousness in scientific psychology. To some extent, however, the facts may be explained in another way. It may be that the word has a distinct meaning and a legitimate use, but that its misuse has brought about a prejudice against it. Possibly, like the word *soul* it comes burdened with such an unsavory history that its usefulness is impaired—impaired, as some have evidently thought, beyond redemption. In the old classical psychology, of which Malebranche is often quoted as the most important source, which Locke generally adopted, and which persists even to this day among many people, sensations, images and ideas were regarded as psychic entities which existed *in* the mind and which could be freely observed through introspection. Consciousness, then, was regarded as a complex of these entities and was often considered to be a kind of psychic stuff or substance. It could, therefore, itself be observed through introspection.

But the evidence for the existence of any such psychic stuff was already waning in the closing decades of the nineteenth century, and it was because of incidental reasons that the word consciousness came into more, rather than less, general use at that time. It happened in this way. This was the time when the words *mind* and *soul* were coming under suspicion. They were burdened with too many unhappy philosophical associations to be any longer useful. But some word was

needed to take their place. If psychology is not the science of mind, it must be the science of something. So it came about that psychology was defined as the science of consciousness, or of conscious states or processes. We may no longer have any minds or any souls, but certainly we are conscious. Here therefore it was thought was a substratum of our mental life which is the real subject matter of psychology.

This was the situation when James wrote his now famous essay entitled "Does Consciousness Exist?" [1] and he bluntly said that as a substance or stuff it has no existence, being only a certain kind of relation. This doctrine was novel only to those unacquainted with the trend of psychological science, but it was the great authority of the author as well as his accustomed bluntness of statement that brought to the focus of attention the decline of the older theory.

Awareness

What then *is* consciousness? Perhaps a simpler method of approach will relieve the subject of some of its difficulties. I am lying in a hammock half dozing when I become *conscious* of an approaching step. There seems to be nothing very mysterious about this. I hear the step; I become aware of it; I notice it; I observe it; it comes to my attention. A person faints

[1] *Jour. of Phil., Psych., and Sci. Meth.*, Vol. I, pp. 447-91.

and loses consciousness; then at a given moment regains it. He begins to notice things, to be aware of what goes on around him, or what goes on within his body. To lose consciousness is to cease to notice things—to cease to be aware of anything, either external objects or one's own organic processes.

To be conscious, then, is to be aware, to notice, to observe, to attend, to be sensitive, to be alert. Presently, of course, we shall learn that these various terms are not synonymous, but for the moment they will serve to point our way.

Awareness is the simplest form of consciousness and with this we should begin. No doubt every case of awareness is a case of stimulus and response, if under the term response one should include any internal happening, any organic or glandular activity following upon a stimulus. No doubt if one wishes to use the word behavior in a sufficiently wide and general sense to include all these organic disturbances and reactions, awareness is a kind of behavior. But it is not behavior in the sense in which we have been using the word, nor as it is commonly used, to denote that which the organism as a whole is doing, as it explores or manipulates its environment, as it adjusts itself to the surrounding world, as it meets and overcomes its difficulties. In awareness the organism is not doing anything in the above sense. It is just aware of something.

It is not controlling anything in the environment nor adapting itself to it. Awareness appears to be a relation existing between living beings and some object in their surroundings. And the ability to come into this peculiar relation is evidently an emergent quality arising at a certain stage in the evolution of organic life. The flower which turns toward the sunlight is certainly not aware of the sunlight. The deer in the forest certainly *is* aware of the approaching hunter. In order to understand what awareness is in our attempt finally to know what the mind as a whole is, it is not necessary that we shall decide at just what stage of evolution awareness arises. It might even seem to some that the flower is aware of the sunlight. If so it would only be necessary to go farther back to still simpler organisms where certainly no such relation as is denoted by our term awareness exists.

Awareness that Is Alert and Anticipatory

But are consciousness and awareness the same? Is not consciousness something decidedly richer and fuller than awareness? Certainly it is, as the word is more commonly used. Here again it is probable that we have a developmental series and it is a matter of custom or personal preference just what word we shall use at the different stages. Consciousness sometimes means awareness that has become alert and antici-

patory. Stewart Edward White, in his book called *Lions in the Path,* speaks of the extreme sensitiveness of the wild animals on the African grass veldt to any rapidly moving object in the vast surrounding plain. What is the word which best expresses the mental attitude of such an alert animal as he grazes along? It seems as though he were *conscious* of the whole plain in every direction at every moment. As Gault and Howard say, consciousness is anticipatory. It lies in wait for the next event.

Consciousness in this sense is quite different from observation, although some psychologists use the words in much the same sense, and no doubt, as we shall see presently, they may be correctly used in this way. But when we speak of a grazing animal being conscious of the whole plain, the element of *meaning* is scarcely present. But let a rapidly moving object come into his field of vision, then his mental attitude is different. He notices the object. It *means* danger—and perhaps he breaks into precipitous flight. At a higher level of animal life notice would be followed by observation, as when a man calmly observes a suspicious object in his field of view and judges its character. The sense data get meaning in this case. The man is conscious of the object but he is something more than conscious. The interpretative element characteristic of all perception is absent in mere consciousness, or only shadowy.

Awareness with Attention and Interest

Evidently, then, while the word consciousness is sometimes used in the sense of mere awareness, a more definite and exact meaning of the word is awareness that is alert and anticipatory. But sometimes the word is used in a slightly different way to indicate awareness that is accompanied by attention and interest, as when a sleeper at night awakens and is conscious of a suspicious noise in the living-room. In this sense it is again a matter of degree, for if a person conscious of a noise which may indicate a source of danger is for some reason debarred from any kind of action, his consciousness of the threatening object would increase. On the contrary, when the stimulus is followed by the appropriate bodily reaction, it diminishes.

Consciousness, then, is not something within us of which we may be aware but the being aware of something. It is not a mosaic of ideas, sensations and feelings; it is not another name for mind; it is not any kind of psychic stuff; it is just the awareness which a living being may have of some object.

Those who are mystically inclined will ask what the possible developments of awareness may be. Zona Gale says, "I believe that living is an exercise in expanding awareness; that a part of that exercise comes through individual growth, another part through human

relationships, and another part through intuition of the presence of God. Since we have now so stunted a growth, such flawed human relationships, such faint divination of the divine, we know that we are still in the early stages of awareness, and that our development has hardly been begun. The heightening of perception is the supreme adventure. The human being, with but a negligible fraction of his brain yet developed, has this supreme adventure." [1]

It is no doubt owing to the belief that awareness may extend beyond our immediate physical environment that the conscious subject has been thought to be some mysterious metaphysical *psyche.* This is the ancient habit of attributing to "spirits" what we cannot understand. As our scientific knowledge of the living human organism increases we cease to wonder at its marvellous powers, even if these powers should be as extended as the mystics seem to think, and we see no reason to believe that a metaphysical psyche would have any higher powers. It would be a case of explaining the unknown by the more unknown.

Experiential Observation

But now we must make note of the fact that a living being may be aware not only of objects in his external environment but of his own body or his own organic

[1] *Unity.* June 11, 1928, p. 265.

processes. He may be conscious of happenings in his surroundings or happenings within himself. He may observe his own behavior, and in this self-observation he sees different aspects of it from those observed by another; for connected with any kind of behavior there is an indefinite mass of organic, kinæsthetic, and glandular happenings of which, in some greater or less degree, the actor himself may be aware, but which is hidden from the view of others.

Behavior as self-observed or "lived through" is sometimes called *experience.* A stone, rolling down a mountainside and colliding with a tree, does not have an experience. A man under similar circumstances has an experience. Things have happened to him and he has responded as best he could and he has been aware of both series of happenings as well as of various internal disturbances. He has been conscious to a greater or less extent of all the series of events. He has "lived through" them.

Experiential observation [1] is the term given by the German psychologist, Koffka, to this kind of consciousness. Koffka uses the illustration of the woodchopper. The latter may be felling trees. This involves various mental processes such as perception, memory, judgment, planning. When the trees are felled the chopper shows signs of fatigue, also of satisfaction and pride.

[1] *Erlebnis-Beobachtung* or *Erlebnis-Wahrnehmung.*

Now let us suppose that an onlooker observes all this. He watches the man at work, seeing him look up at the tree and down to the ground, estimating, planning, deciding. Then he sees evidences of fatigue, of joy and pride. He pursues thus the method of the behaviorist, studying in this way the mental processes of the man.

But now all that the onlooker has observed the woodchopper himself has lived through. He has experienced it. He has been conscious of it. And his way of observing the whole series of events has some marked advantages over the way of the onlooker, if possibly some disadvantages; for a certain vital part of the drama, the internal part, has been concealed from the latter. In fact to the onlooker it has not been a drama at all—just a prosaic piece of woodchopping. In the "experience" of the laborer it may have been connected with a whole history of hopes and expectations, even of loves and longings. Hope and fear and fatigue may be read by the onlooker, perhaps in the expression of the face or the gestures of the laborer, but the organic sensations, the visceral stirrings and the unexpressed emotional factors are known only to the latter.

This double way of observing behavior has led in the past to much needless confusion. It has nothing to do with any metaphysical double-aspect theory of reality, or with the mind-body problem. Its significance is that it offers two ways of approach to the study of human

behavior. The behaviorist, realizing the complications arising in the introspective method, has despaired of using it at all and has fallen back on the simple and safe objective method. On the other hand, going to the opposite extreme, some psychologists have said that the reality which we call mental is known *only* through experience, and have even defined psychology as the science of inner experience. In other words, the field of the experientially observed is the only field of mental life.

But only a slight survey of the subject should show the error of the last-named view. The field of the experientially *un*observed is constantly widening in modern psychology as we study the life of the lower animals, of primitive man, of children, and even of adults. Consider, for instance, the man of the forest, *hungry, keen, intent* on the pursuit and capture of some animal to satisfy his imperative need. The *cunning* of the beast must be matched by the greater *cunning* of the hunter. Both are *watchful* and *resourceful,* but the resourcefulness of the man is superior. *Skilfully, recalling* his knowlege of the habits of his prey, he *devises* some trap or snare or lure or weapon or swift arrow or bullet, his actions involving *memory, ideational construction, perception* and *reasoning.*

Here, then, we have a whole series of mental processes of both man and beast, probably all of them expe-

rientially unobserved. Hardly more than the animal is the primitive man capable of introspective observation, and in the case cited the attention of both is completely objectified. Both are wholly absorbed in the game of life and death. They have no time and little ability for observing their own behavior. They are intent upon the behavior of their opponent.

We can understand therefore how it is that the behaviorist, seeing how limited is the field of introspective knowledge of mental life in the various branches of psychology, decides to renounce it altogether. But it does not follow that the introspective method is valueless just because its field is limited. The method of the behaviorist is not only fruitful but primary, and in many branches of psychology is of course the only method. But the method of experiential observation, when it can be used, as in adult human psychology, is also fruitful and yields results of great value to the science.

Self-Consciousness

Reviewing what we have learned thus far about consciousness, we have seen that its primary meaning is just simple awareness, but sometimes awareness that is alert and anticipatory, or awareness accompanied by interest and attention. And we have seen that the object of such awareness may be some thing in the

world around us or some condition or process within ourselves. The latter, it would seem, might be called self-consciousness, but this term is commonly used in a different sense, which we must now consider.

By self-consciousness in this new sense is meant not the awareness of any inner state or process, but the awareness of one's total self in its physical, social and historical relations. For instance, we are self-conscious when we are thinking about ourselves and the impression we are making upon others.

The simplest form of this kind of consciousness arises when there is some delay or impediment in the habitual reaction to some accustomed stimulus, and the attention is thus turned back upon ourselves. The wild deer in the forest hears the familiar note of danger and instantly takes flight. Such an unobstructed reaction moves smoothly to its end and would never lead to the development of any consciousness of self. But in the evolution of animal life, there comes a time when some readjustment of the old reactions in the presence of conflicting stimuli is necessary. Consciousness of self has its origin in such situations. Certain schools of psychologists have therefore made much of the fact that consciousness arises in conflict and friction. Descriptively, however, we may say that self-consciousness, as we are now using the term, is the awareness of the relations existing between the several parts of

one's personality and one's environment, particularly one's social environment.

An illustration will make this clear. In regaining consciousness after an anæsthetic there is first a mere awareness, perhaps of voices. They suggest nothing. We may be said to be conscious of them. Presently, however, as the effect of the drug is narrowed, the voices begin to have meaning. They are the voices of the nurses or the doctors. We are beginning to become conscious, that is, self-conscious. The whole situation dawns. Memories return. Reflection begins. *I* am here. *I* have been ill. There was an operation. My wife and children are anxious. As the relations widen, self-consciousness takes the form of a connected story, in which a mass of mental furniture, my own name, my personal memories, my home and daily surroundings, my friends, relatives, and social connections, my hopes, fears and ambitions, are all grasped together in a familiar unity.

Self-consciousness is the distinctive term characterizing this situation. It is the awareness of one's self in one's interrelations, or the awareness of the relations of any present object or any present thought to the various elements of one's personality, including one's memories of the past, and one's hopes and plans for the future. It is characteristic of an advanced stage of evolution, when human beings possessing language,

personal names, personal histories and social relations become aware of all these in their interconnections and their fusion into a unity of personality.

Personality

As regards personality, it would be interesting to inquire concerning its relation to self-consciousness. It has sometimes been supposed that self-consciousness is an integral part of personality, such that the latter could not exist without it. It is, so to speak, the stuff of personality, its condition and support. The notion of personality, it has been said, involves the notion of a historical being in which the past and indeed even the future by anticipation are embraced in a distinct unity constituting personality. To effect such a unity, it is said further, is the function of self-consciousness. That peculiar voluntary and purposive control, that grasping together of the past and the future, that continuity of experience which is the very essence of personality, can only be realized by a self-conscious, purposive being.

From this it is only a step to the claim, so often made in the history of the philosophy of mind, that it is wholly inconceivable that matter, however highly organized it may be, could ever display qualities such as these. We must therefore, it is said, believe that in its ultimate essence mind is not material but spiritual.

Such a hypothesis seems to furnish to many a certain satisfaction. But we must remember that explaining things which we cannot understand by attributing them to the action of "spirits" is a very ancient practice and one which, if encouraged at the present day, would not be likely to advance the standing of psychology among the sciences. Thunder, lightning and eclipses were formerly explained in this way.

The concept of personality is indeed one to be most highly exalted, and the term *spiritual* may be applied to it, if the latter term is used in its intelligible sense of supremacy in ethical or æsthetical value. Furthermore, the quality of apprehending in their togetherness the various elements of one's being in self-conscious awareness is a pre-eminent quality of the living human individual. But it does not follow from all this that self-consciousness is the very stuff of personality, or even necessary to its existence.

Persons may be self-conscious and no doubt are, but clearly it is not self-consciousness that makes them persons. It is rather the integration and co-ordination of their activities and their strivings. It is a system in which our memories, our names, our written signatures, our language, our hopes, aspirations, and supreme wishes, our friends and social relations, are characteristically integrated and co-ordinated.

Self

Persons therefore exist, and the living human individual is the person, and any person may have unique qualities of mind or body which distinguish his personality. This also brings us into position to understand what is meant by the word *self*. The term has been used in many senses, leading to great confusion. Sometimes it seems to be a refuge for those who hold the older historical doctrine of the soul but who prefer to avoid the use of the term. Again, the self is defined as the organization of mental processes, or an "individual regarded as a progressively organized system of mental functions and processes." [1]

It is not quite clear what this means, but there should be no difficulty in understanding what the self is. Here as elsewhere a great simplification takes place as soon as we realize that what we have is a living human being doing something—thinking, perceiving, remembering, being conscious. This living human being then is the self. He himself thinks, perceives, remembers, is conscious. The self therefore is not the mind, for the mind is the name not of the actor but of the activities, the thinking, remembering, perceiving, being conscious. The self is the living being who does these things; not

[1] "Definitions and Delimitations of Psychological Terms." *Psych. Bull.*, Vol. 15. No. 3.

the organization of experiences but the organized being who has the experiences. The self is the minded body, the living individual, with his needs and interests, his store of potential memories, and his capacities for thought, feeling, and creative imagination. The self furthermore is both observer and observed. We are aware of our surroundings and aware also of ourselves. From the latter fact arises the peculiar connotation of the word *self*.

CHAPTER IV

INTERESTS

THINKING, reasoning, planning, reflecting, deciding, remembering are activities of living beings. If we use the word mind in its common every-day meaning, it signifies just such things as these. Mind is thus almost synonymous with behavior, for in all these things the living being is *doing* something, usually adjusting himself to his surroundings.

It transpired, however, in the last chapter that it would be rather hasty to say that mind is adaptive behavior and nothing else, although some psychologists have taken this position, for we discovered that there *is* something else which distinctly belongs to mind, but which cannot be described as any kind of adaptive behavior, this something else being what is known as consciousness. We found furthermore that consciousness is not any mysterious stuff or substance, nor again another name for mind, but that it is just a peculiar kind of relation between the living being and its environment—a relation which we call awareness.

But even then the story of the mind is not fully told. From time to time in the preceding pages reference has been made to certain other elements which seem to be mental elements and which nevertheless are not to be embraced under the notion of adaptive and selective behavior. Living beings have interests, wishes and desires, and their conduct seems to be actuated by these interests and desires. Thus far, however, we have given no satisfactory account of them. They surely exist, they are certainly mental, and apparently they are not forms of behavior. They seem to be springs or motives of behavior—the incentives to activity. It is quite time to take these into account in a book which purports to tell about the mind.

Man a Wisher as Well as a Doer

Some one has said that man is primarily a doer and a wisher. If in this quotation we place the emphasis upon the word *and,* we shall have the keynote of the present chapter. It is not sufficient to describe man as a behaving animal; he is also a satisfied or dissatisfied one. He is not only an actor but a lover. He is not only an observer but an interested observer. A living being responds in a certain way when stimulated; but he also goes out in search of stimuli. He has propensities—"governing propensities." He has explorative tendencies and these must be taken into account,

if we would fully describe such a being. It is not sufficient to study the behavior of an organism; we must study also its springs of behavior, its propulsions and impulsions.

Even the simplest micro-organism is not quiescent, waiting until something happens to it. It is restless and, shall we say, dissatisfied until it gets into certain adequate relations with its environment. It needs something and seems to desire to satisfy its needs. Even the most hardened behaviorist, whose attention is persistently focussed on an organism's responses, does not hesitate to speak of an "optimum relation" between the organism and its environment. Some situations are *better* for the organism than others, and it strives to get into such relations. Organisms are full of *urges,* and although it may be difficult to explain these urges, it is at any rate necessary to describe them. Animals are curious as well as resourceful; men are aspiring as well as thoughtful. Some inner urge pushes them on. Napoleon and Lincoln cannot be fully explained by their clear vision, their retentive memory, their constructive imagination; there is something which drives them on—will-to-power, ambition, love of justice, hatred of wrong.

In the early pages of this book it was said that not only knowledge but the longing for knowledge must be explained. Psychologists have given relatively too

much attention to the former. The importance of taking account of the needs and interests of human beings is shown by the fact that knowledge itself depends upon them; for the whole body of our knowledge, scientific or cultural, is determined to some extent by our choice of the particular kind of concepts by which we interpret the sense data given in experience,[1] and this choice is determined largely by human needs and interests. Were the latter different, the objective world which we know would be different.

Interests and Wishes

Again, no student of the science of economics fails to recognize the fundamental importance of human desires. They are the elemental things in human life and his whole science depends upon them. Likewise ethics and the social sciences generally are immediately concerned with the impulses and motives which prompt to action or determine it. One has only to remember to what extent all human activity revolves around the notion of value and then to recall that values are determined by interests. In Professor Perry's recent work on *The General Theory of Value* more than four hundred pages are devoted to a dis-

[1] Compare C. I. Lewis, "The Pragmatic Element in Knowledge," *Univ. Cal. Publ. Phil.*, Vol. VI. No. 3, pp. 218, 219.

cussion of *interest,* the value of an object being said to lie in its relation to interest.

There is a noticeable trend in psychology at the present time toward the study of interests, toward those elemental things which are the deep sources and motives of behavior. As Thurstone says, "the real ruler of the domain which psychology studies is the individual and his motives, desires, wants, ambitions, cravings, aspirations." [1]

Many names have been given to these mental elements, the very richness of the vocabulary attesting their peculiar human significance. *Instinctive striving, purposive striving, conation, will, wish, libido, desire, appetite, craving, impulse, instinct, sex, hunger, longing, the drive, the biological interests, the non-reflectional elements of experience, the "energy influences seething and bubbling in the organism,"* are some of the terms applied to this class of elemental things. Some Freudians have used the term "psychic energy"; but energy, a word taken over from another sphere, suggesting as it does something quantitative and measurable, seems less appropriate. For in the sphere of interests what we seem to have is a tendency—a tendency to grow, expand, develop, and a striving toward some goal. Neither is the term *drive* especially approp-

[1] L. L. Thurstone, *The Nature of Intelligence,* p. 18.

riate, though it fits well with the dynamic philosophy of our day. Some term suggesting that which is overflowing, productive, creative, would be better.

Though we may not accept the Freudian term, psychic energy, we cannot fail to recognize the very great influence of Freud and his school in calling attention to those primary constitutive elements of the mind which they call the wishes. By the wish they mean not a definitely formulated conscious desire, but any sort of mental set or tendency to action.[1]

Some of the terms enumerated above seem to suggest unverified vitalistic philosophies or to point not to facts but to hypotheses to explain facts. They are mentioned merely to call attention to the richness of the vocabulary in the sphere of human and animal interests. Even the phrase *purposive striving* would seem to many to savor of a vitalistic or animistic theory. This term may be used, however, as merely descriptive of what is actually observed in living organisms. A hungry cat in a cage with food outside presents a situation which is quite correctly named purposive striving. No one would hesitate to say that the cat is trying to get the food. But the words, *purposive striving,* and the phrase, *trying to get,* are the same in meaning. Such expressions are not "loaded" with metaphysical

[1] See Tansley, *The New Psychology,* p. 13.

theories. They are merely convenient descriptive terms.

There is another term in the list which calls for comment. The earlier Freudians unduly emphasized the place of sex among the conative tendencies or drives, failing to note the comparatively unimportant rôle of the sex impulse in the daily life of the lower animals. But while sex is only one of the many impulses, it serves as a good illustration of the intrusive, urgent, disturbing character which belongs more or less to all the impulses and desires, marking them off sharply from the stimulus-response mechanism of adaptive behavior.

What Place Have the Urges in the Philosophy of Mind?

Now what shall we say about these as yet mysterious impulses and interests of living beings? What are they and how are they to be fitted into a philosophy of mind?

This whole problem of the mind we found to be greatly simplified when we learned that the mind is just the name of a certain class of activities of living beings, those by which they adjust themselves to their surroundings. But these impulses and urges which have now sprung into view do not seem to fit into that plan. They seem rather to be dispositions, propensities, tendencies—to be *sources* of activity and *springs* of behavior. The difference comes out clearly in the case

of instinct. The word instinct has two meanings, causing confusion sometimes. It may mean the inborn impulse to act in a given way, or it may mean the given way in which there is an impulse to act. It may mean either native impulse or native capacity. The latter depends upon an inherited behavior pattern or action system. A bird has a native impulse to build a nest. Such an impulse is commonly called instinctive. But the various movements in the building of the nest are activities whose form and sequence are determined by inherited behavior patterns. To such activities, muscular movements, or responses the adjective *instinctive* is often applied. These instinctive movements we have considered in a former chapter when discussing adaptive behavior, but the instinctive urge is evidently something entirely different.

Hopeless indeed would it be to try to find out what the mind is, if this involved a complete explanation of animal and human interests. We should have to plunge into the ancient and modern controversies among the mechanists, vitalists, and teleologists. In the following chapters will be found some reference to these contrasting views, and we shall learn that these old differences have been much softened by recent studies in the philosophy of evolution, which show how all the way up the evolutionary ladder new prop-

erties arise as the result of organization. At present we are not greatly concerned with these genetic and metaphysical problems, for we are interested in finding out what the mind is, and it is just now sufficient to recognize that desire, striving, impulse, will, appetite exist as facts in living beings, that they belong to that total thing which we call the mind, and are not forms of behavior in the sense in which we have used this term. Probably no one would care to question either their existence or their rightful position as parts of our mental life. They have been the theme of psychologists since Plato first wrote about the appetitive soul, and they have been the subject of the most vital and absorbing chapters in psychological textbooks during all the centuries.

The question might, however, be asked whether impulses and interests are not just another form of behavior, needing no separate chapter for their treatment. Of course, the word behavior may be used in a sense sufficiently broad to include all vital activity whatever, visceral and glandular responses or the stimuli thereto, or even organic modes, for organic modes are after all modes of action. But this is neither the common nor the scientific meaning of the word behavior. In biology the term means the action of the organism as a whole in relation to its environment. The organism acts as a unit in its responses to environmental factors.

Behavior is the reaction of an organism to its environment.[1]

Evidently, if we use the term behavior in its accepted sense, the instinctive strivings, urges, impulses, and governing propensities are not forms of behavior.

The important thing, however, is not this matter of terminology, but whether the instinctive strivings and impulses of living things offer a field distinct from that of the adaptive behavior which in a former chapter we have found to be the meaning of mind in its narrower and usual sense, so that there would be justification for discussing them in a separate chapter under different categories. Such justification there seems to be. In adaptive behavior the organism is adjusting itself to new situations; it is solving problems. But the presupposition to all such adjustments is the presence in the organism of purposive striving. Adaptive behavior carries the idea of persisting in a given course or quest in the face of certain new situations or obstacles. It presupposes some kind of goal to be attained, so that when obstacles intervene, adjustment and adaptation are necessary. When the wind changes, a sailing vessel has to shift its sails and rudder, that is, it has to do so if some given objective is to be reached.

Adaptive behavior thus assumes that there is some

[1] Compare C. M. Child, *Physiological Foundations of Behavior*, p. 1. Compare also "Definitions and Delimitations of Psychological Terms," *Psychological Bulletin*, March, 1918.

optimum relation between the organism and environment. It assumes that the organism has interests. The psychology of intelligence, thought, and reasoning begins with action which originates in the environment; it deals with stimulus and response. The psychology of interests begins with the origin of action in the person himself; it deals with impulse. For incidental reasons psychologists of recent decades have concerned themselves almost wholly with responses and their mechanisms. Perhaps the real nature of living beings is better understood by thinking of them as self-active beings rather than as stimulus-response mechanisms. The following quotation from Thurstone is instructive:

> The point of view that is implied in abnormal psychology, according to which conduct has its root and starting-point in ourselves, is in better harmony with the other sciences that concern human nature. It is certainly easier for the preacher, the judge, and the teacher, to accept a system of psychology according to which conduct springs from man's inner self than to assimilate a psychological interpretation according to which we become reduced to reflex response machines that continually react to a fortuitous environment. The study of ethics, criminology and sociology is certainly made more illuminating by a psychology that looks to the inner self as the mainspring of

conduct and according to which the stimuli of the environment become merely the avenues through which that inner self is expressed and satisfied. It is just this point of view in the interpretation of human nature that psychoanalysis has emphasized, and that is primarily the reason why it has found popularity as an explanatory method in that large field of phenomena which is dominated by human nature. It is this shift of interest from the *stimulus-response relation to the wants of the living self* that marks the fundamental difference between what we know as the old and the new psychology.[1]

Older Theories of Interest

But the more we emphasize the importance of interests, impulses and wishes, the more curious we become to know just what they are. In this quest, if we turn to the psychological literature of the past and present, we shall probably meet with disappointment. Long ago it used to be said that the soul consists of intellect, feeling and will, the latter embracing the self-active nature of man. In more modern standard texts in psychology, impulse, instinct and will were simply treated descriptively in separate chapters, as in other chapters memory, perception and reasoning were dis-

[1] L. L. Thurstone, *The Nature of Intelligence,* Preface, p. xiii. Harcourt, Brace and Company.

cussed, with no recognition of any fundamental difference.

A later stage of the inquiry in classical psychological literature limits the whole subject of wants, interests, and motives to the discussion of satisfiers and annoyers, satisfaction following from the general exercise of neurones, or from nervous conduction in conduction units which are ready to conduct, and annoyance from the failure of such exercise or conduction,[1] truly only a partial answer to the profound problem of interests and impulses.

In the behavioristic literature of the present we get little satisfaction in our search for a real understanding of interests and wishes. We hear only of reflexes and reactions, of explicit and implicit behavior, and of organic, visceral and glandular responses. If we ask what the source of all this is as regards the person himself, we are vaguely told of the energy released by the metabolism of the organism. But in the latter phrase it seems as though there were an unconscious play upon the word energy. The term energy as used in the physical sciences does not suggest any governing propensity. It has no implication of the quest, nor of striving, wishing, craving. No progress whatever will be made in the philosophy of mind by correlating the

[1] Compare, for instance, Thorndike, *The Original Nature of Man*, Chapter IX.

interests of living beings with any form of energy known to physicists.[1]

If we turn to the Freudians, we find that the *wishes* are not only recognized but acclaimed, not only acclaimed but given the important place in the mind which they seem to deserve. But when we ask the Freudians for an explanation of the wishes, only disappointment awaits us. They seem to regard them as psychic forces, which is about as illuminating as it would be to explain earthquakes by calling them seismic forces. Like the Censor and the Unconscious, psychic forces are counters which the Freudians juggle with.

[1] It should be understood that the radical behaviorists are not attempting to give a complete description of the mind. They are attempting the interesting experiment of limiting their study of the mind to what can be objectively observed, measured and compared. One can observe another person *doing* something, but not, as they say, desiring or wishing something. They therefore limit themselves to the former without denying that the latter exists.

Of course some of them go beyond this reasonable position, as when Professor Max Meyer speaks of satisfyingness as a mythological term. He prefers to substitute the term "susceptibility," which seems to him to be a legitimate hypothetical biological property, choosing as he does to regard satisfyingness as a "metaphysical (spiritual) entity." (See Max F. Meyer, *Abnormal Psychology,* p. 270.)

Probably this author would find few supporters for his contention that satisfyingness is a less useful and legitimate hypothesis than that of susceptibility. To speak of the satisfyingness of food to a hungry man or of a cigarette to a smoker does not seem to be a very unreasonable use of language. The extent to which psychology has in the past been dominated by mythological conceptions is illustrated by the fact that in the reaction a writer could be led to such a preposterous statement as that satisfyingness is a metaphysical (spiritual) entity, while susceptibility is a legitimate hypothetical biological property.

Interests as Aspects of Organic Life

Shall we then turn to the biologists, physiologists, and neurologists for an explanation of these elemental things? Here we shall probably be told that interests and wishes are one aspect of that "general motility" which we call *life*. They are a part of the insurgency of life. Life itself is expansive, urgent, insurgent, inventive, creative. It is struggle, effort, appetency, impulse. Living beings do not appear to be *driven* along. They seem to be needing something, craving something, seeking something. Even in the primeval slime this strange capacity was present, the capacity to struggle against the environment, to control it, to appropriate from it what is needed. Life is ever pulsing and overflowing.

> Living creatures press up against all barriers; they fill every possible niche all the world over; they show that Nature abhors a vacuum. We find animals among the snow on Monte Rosa at a height of over ten thousand feet; we dredge them from the floor of the sea, from those great "deeps" of over six miles where Mount Everest would be much more than engulfed. It is hard to say what difficulties living creatures may not conquer or circumvent. . . . When we consider the filling of every niche, the finding of homes in extraor-

dinary places, the mastery of difficult conditions, the plasticity that adjusts to out-of-the-way exigencies, the circumvention of space (as in migration), and the conquest of time (as in hibernation), we begin to get an impression of the insurgence of life. We see life persistent and intrusive—spreading everywhere, insinuating itself, adapting itself, resisting everything, defying everything, surviving everything.[1]

Continuous activity reaching out for external goods and appropriating these, and self-aggrandizement are universal progressive biological factors. The organism tends to expand, to enlarge its sphere of action, to grow, to 'be fruitful and multiply, and replenish the earth and subdue it.' This is a real élan vital, though no more mysterious or metaphysical than are other well recognized vital properties. This is merely another way of phrasing the struggle for life universal in of biological realm.[2]

This general motility and overproduced movement, this so-called spontaneity of action, is an important factor in all higher forms of behavior.

[1] Quoted by permission from *The Outline of Science,* (Vol. III, p. 708) edited by J. Arthur Thomson (4 volumes, New York; G. P. Putnam's Sons).

[2] C. Judson Herrick, *Neurological Foundations of Animal Behavior,* p. 298. The Macmillan Company.

Even the lowest animals exhibit some rudiments of that spontaneity to which Max Eastman refers in an interesting passage:

"We shall find not only that experience as such is welcome to life, but that life of its own accord goes in search of experience. That 'general motility' which Jennings has to add to the specific reactions in writing the biography of lower organisms, will, if separately dwelt upon, supply a standpoint from which life can be viewed as fruitfully as from the standpoint of adaptation to stimuli. We are not merely trying to adapt ourselves in order to stay alive, but we are trying even more energetically to live. Everything we do and think is not a reaction; a great deal of it is action. The "Behaviorist' is not so much to be condemned for his refusal to observe or consider 'states of consciousness,' as for his totally inadequate view of what he does observe and consider. The interaction of organism and environment is for him carefully divided into reflex arcs, all operating in one direction. A stimulus to the end organ, a commotion in the central nervous system, then a response in the muscles—that is the whole story of life in his laboratory. But life interflows with reality in full circles. We do things not only because we have a sensation, but also in order to

make a sensation. And so do the most elementary organisms. Any rubber ball can react, but it requires life to act. And life does act. It seeks experience."

Experience is not something to which the organism is passively subjected. In response to stimulation it reaches out actively to meet the exciting agent; but it does more than this, it is constantly seeking new contacts. And this restless search for food, mates, and other desirables for the satisfaction of inner cravings leads up to higher manifestations in curiosity, the unquenchable impulse toward scientific discovery, and the divine fire of creative artistic genius. The evolutionary factor here is more than self preservation; it is self realization and fulfillment.[1]

Reflections such as these have led many to believe that the conative tendencies in living beings are a part of a kind of cosmic Creative Effort,[2] which is trying to express itself in individuality and freedom. In evolution itself there seems to be some trend or tendency or drift toward greater complexity and new integrations.

[1] C. Judson Herrick, loc. cit., pp. 17, 18. The quotation is from Max Eastman, "The Will to Live," *Journal Phil.*, Vol. 14, pp. 102-107.

[2] See L. T. Hobhouse, *The Rational Good*, pp. 229, 230.

There seem to be formative forces struggling for expression. An American biologist puts it as follows:

> While the fact of evolution has been established . . . there still remains unexplained, the great onward rolling tide of life, which bears man riding like Neptune on its crest. . . . Considered as a process rather than as a road, evolution is the struggle of life with its environment, a struggle for freedom, leading to the triumph of the mind and the winning of individuality; it is the struggle of the spirit within us to be superior to matter, to secure a fuller individual life and a larger freedom.[1]

Interests as Organic Modes

The above quotations represent an attitude which probably expresses the feeling of many scientists today, but in general there is a tendency to avoid expressions which might be criticized as metaphysical and to suspend judgment in the hope that step by step scientific research will discover the missing links in the chain. If it is said that impulses, wishes and interests are merely aspects of organic life, then the hope is expressed

[1] Albert P. Mathews, "The Road of Evolution," pp. 340, 344, 346. Reprinted from The Yale Review for January, 1922, by special permission of the Editors and the Author.

that science may in the end unravel the mystery of life itself and reduce it to the terms of physics and chemistry.

The conative tendencies, the governing propensities, the ordering capacities, must indeed be recognized; but in explaining them it is not necessary, it is said, to assume any non-physical agency such as the élan vital of Bergson or the Will-to-live of Schopenhauer, nor yet any special life force or hormic energy, nor any psychoid or entelechy nor any mystical Creative Effort. On the contrary, it is said, we are to regard them as organic modes arising from unique combinations of physico-chemical energies in peculiar vital patterns. A living being is a definite and orderly integration of protoplasmic and environmental factors. But how this integration takes place, and what the organizing factors are, present a final problem, of which there is at present no physico-chemical solution. Probably most of the mechanically inclined biologists would say that *some* dynamic change has resulted in that peculiar "ordering capacity" which characterizes living things. But then that strange and almost infinitely potential dynamic change would itself become an ordering capacity. Hence that constructive process which appears in the world of living organisms as the will-to-live would simply be carried further back. "Back of all evolutionary processes lies a universal compulsion to con-

structive action." [1] Apparently the only alternative would be the view that the dynamic change which issues in life and all its potencies was an accidental grouping of physical and chemical units. But the realm of the fortuitous has narrowed as science has widened its gaze.

One other point should be noticed. When physiologists tell us that wishes and interests are organic modes, the phrase itself should be examined. It merely means a mode of activity, a manner in which an organism acts, the activity in this case evidently being of an inner or organic kind. Interests, wishes, and conative tendencies would then be qualities, properties, or activities of organisms. The single elements of an organism would not in themselves have such properties, but the organism has them; just as oxygen and hydrogen, the elements of water, would not have the peculiar properties of water, though the water does have them. The conative tendencies are then what are called emergent qualities. They arise or appear when the organism appears. What seems therefore at first sight to be a purely physico-chemical theory turns out to be quite different. Physics and chemistry give us no knowledge of any principle or force of organization nor any explanation of the emergence of the peculiar properties which organisms exhibit. The

[1] William Patten, *The Grand Strategy of Evolution*, p. 129. R. G. Badger.

hope may indeed be held out that the connection between the single elements of the organism and its properties and activities will be discovered and found to be expressed in physical or chemical terms. But this is by no means certain, while the explanation of organization itself in such terms becomes more and more a problem. It may be that physics and chemistry represent just a stage in evolution and that some other aspect of nature lies back of them. It might even be that some form of appetency or will or effort lies further back.

For instance, there are some who believe that the attempt to explain life mechanistically is no more hopeful or fruitful than the attempt to explain mechanical processes vitally. McDougall's philosophy of mind seems to reduce to this in the end. He regards the purposive striving which characterizes living organisms as an independent reality distinct from the physical body and not to be identified or confused with any mechanical process whatever, and not to be referred to any more fundamental notion. It may even be regarded as the animating principle of the body itself.

In some of McDougall's writings he seems to consider the purposive striving as an expression of a fundamental appetency in nature. This leads him back to a theory of monads similar to that of Leibniz. McDougall's apparent dualism is thus resolved into an

idealistic monism, the monads, whose essential quality is appetency or striving, making up all reality, including the body itself.[1]

Finally

In these metaphysical speculations we are not at present greatly interested. Some further reference to them will be made in the following chapter when we inquire into the nature of reality in connection with the problem of the reality of mind. For our present purpose it is sufficient to have shown not only the presence but the elemental character of the impulses, wishes, and interests of living beings and the important part which they play in that total thing which we call the mind. The question whether they may be the animating forces of the body remains just an interesting speculation. We hear a great deal about the brain and nervous system as instruments for the more and more perfect adaptation of the organism to its environment. We seem to know what they are instruments *for,* but what they are instruments *of* has never been told. Can they be instruments of the wishes and interests, means for the realization of vital needs?

Bergson believes that there is "some original and essential aspiration of life, which is the mainspring of evolution itself, leading up to the presence of organic

[1] See his *Introduction to Social Psychology,* 16th ed., pp. 361-363, and his *Outline of Abnormal Psychology,* pp. 545, 546.

life and finding its full expression only in human society." Whether or not this be true, it may be that in the sphere of impulses and wishes we find that *freedom* which we feel but cannot understand, that *progress* which we see but cannot explain.

CHAPTER V

THE PHILOSOPHY OF BEHAVIOR

THAT mind is behavior we have seen in the earlier chapters of this book. That mind is something more than behavior we have seen in later chapters, for we have learned to take account of that very important aspect of mind which we call impulse, instinctive striving, or the explorative propensities of living beings, and we have had to raise the question about consciousness. We have found that neither of these aspects of mind could be embraced strictly under the general concept of behavior.

Nevertheless, we have after all come to the conclusion that the very essence of the mind, as the word is commonly used, is selective and adaptive behavior. What is it that we mean when we ask the question, Does your son have a good mind?, or when we say, My mind is better than my neighbor's? What would we mean if we related that travelers to a new and strange land had seen no inhabitants but had observed evidences of mind. In all these cases, I think we should

certainly mean something like intelligence, memory, imagination, planning, contriving, thinking. These are all processes, activities. Some individual is doing something. He is adjusting himself to his environment, controlling it or responding to it. One who has a good mind has a capacity for doing these things well.

The Significance of Mind as Behavior

Since, then, mind is essentially behavior, it seems necessary finally to reflect upon the significance of this fact. It raises several perplexing questions. If thought and reasoning are activities, are they the same kind of activities with which we are familiar in the physical world? In the physical world we have, according to current views, just matter in motion, mass particles in space operated upon by mechanical forces, forces known in natural science. Are we then to regard the mind as a form of motion, or, at any rate, are we to treat it quite in mechanistic terms? Are we to discard our belief in any kind of psychical energy or psychical being and reduce the whole realm of mind to physical forces or physical entities? May all mental activities be reduced in the last analysis to physical and chemical changes? Is the entire universe, including the human mind and human society, to be explained as merely certain configurations of atoms, or the electron-proton constituents of atoms?

As soon as we begin to speak of the mind as behavior, do we not become "behaviorists" and is not behaviorism a materialistic doctrine threatening the dignity and value of the soul, and destructive to moral and religious ideals? Popularly it has that reputation. Furthermore, does not this view of the mind threaten also its reality? Do we not lose the mind and have nothing left but the body? Certainly it would be serious if the new psychology should threaten either the dignity or worth of the mind and calamitous if it should endanger our ethical or æsthetical ideals. If it threatens the *reality* of the mind, it would be doomed forthwith, for this reality is self-evident. It is mind that rules the world and makes things go.

Science itself is the product of mind, and philosophy is the peering of the mind into the secrets of Nature, while art is the embodiment of the mind's ideals and aspirations. Love, sympathy, pity are Earth's finest products. Suspicion, hate, fear, envy, avarice, ambition, greed—these are real things. No one questions their reality. Stocks and bonds are no doubt real, but no more than our desire for them, or our striving to get them, or the devices and deceits by which we acquire them. And thought is real, and when a great thought is released, civilizations change. Evidently, then, if the modern view of the mind as activity or behavior threatens its reality, it is thereby in advance condemned, while

if it threatens its dignity or worth, it would cease to interest most of us.

This whole subject needs a good deal of clearing up, and fortunately contemporary science, mathematics, philosophy and psychology are all cooperating to clear it up. The fact is that the concepts implied in the above list of objections and difficulties are largely inherited from the nineteenth century and are no longer adequate for the interpretation of the meaning of life and mind. That ancient chapter in the history of philosophy relating to the disputes between idealists and materialists is drawing to a close. It is recent science itself which is changing the perspective so that this old controversy is obsolescent if not obsolete. Presently we shall see how all this is happening and how the notion of mind as activity causes it to lose none of its supreme reality. But first it will be helpful to say something about behaviorism, which has, in the opinion of some, an evil name.

The Different Kinds of Behaviorism

Behaviorism itself is an indefinite term and has several meanings. Originally it was merely the name of a new method in psychology, supplementing or replacing the older method of introspection. Discouraged by the lack of agreement on the part of psychologists, the

behaviorists proposed to try the objective method used in all the natural sciences and already so successfully used in the study of animal psychology, the only method, of course, there available. They proposed to observe the conduct of human beings as an objective phenomenon, subject to the usual rules of observation and verification. The use of this method does not necessarily exclude the use of other methods, if they are found profitable. Nothing probably in the whole history of psychology has done so much to give this science respectable standing in other scientific circles as this method of the behaviorists. It is now welcomed by every school of psychology and universally accepted, though not necessarily to the exclusion of other methods. It is surely innocent of any dangerous philosophical implications.

Behaviorism, in the second sense, is the view that mind is essentially behavior. Living beings *act* in certain ways and *do* certain things. To certain classes of these activities, especially those that are selective and adaptive, we apply the term mental. This second form of behaviorism, while it recognizes that what is meant by mind in common usage is just such adaptive and selective behavior, nevertheless, does not make any claim that the concept of behavior necessarily covers the whole field of mind. It does not deny that there may be other factors in mind which cannot strictly be

called behavior, such as the so-called biological interests and native impulses, and furthermore that peculiar relation or dimension called consciousness or awareness.

Finally there is a third sense in which the term behaviorism is used. It refers to what is sometimes called radical behaviorism, which teaches that mind is simply and solely behavior and nothing else. It neglects or repudiates the method of introspection wholly and omits usually all reference to consciousness. It would be profitable to examine this radical behaviorism, accepting it at its full value and making the inquiry whether the mere theory that mind is behavior and nothing else has any materialistic implications or any demoralizing consequences. Perhaps the pages which follow may incidentally throw some light on this question. Although radical behaviorism might turn out to be more innocent than it sounds, nevertheless from the psychological point of view it has several failings.

Since so much is made of behavior, one cannot understand why the *springs* of behavior are so constantly ignored. Too much emphasis is placed upon the organism as a mere stimulus and response mechanism, a sensori-motor reaction system, and too little attention is given to its spontaneity and initiative. Contemporary studies in abnormal psychology and the persistent and

irrepressible interest in the Freudian movement are doing much to correct this one-sidedness. As regards introspection, it is probably due to the partial failure of this method as used in the past that the radical behaviorists repudiate it wholly. As experiential observation it is valuable as widening our approach to the mind and as supplementing the objective method. The radical behaviorist errs also in his complete neglect of the subject of consciousness. Consciousness, as we have seen in an earlier chapter, is a distinct feature of the mind, and its position though subordinate can never be ignored.

A third error in radical behaviorism is its strong philosophical bent, its determination to show that there is some peculiar prerogative about the laws of physics and chemistry, giving them power to explain everything in the universe, which thus becomes "the totality of the electron-proton aggregates and the changes that occur in their special relationships." This has led some extreme behaviorists to neglect to analyze the meaning of the word aggregate and the nature of the changes. In other words, they have failed to take into account the full significance of evolution. Relatively few of the psychologists of today hold this extreme form of behaviorism, but the general behavioristic conception of mind is more and more impressing itself upon contemporary psychology, while the

objective method of study is more and more emphasized.

From this it will be seen that behaviorism is a rather indefinite term, applied variously to a mere psychological method, or to a general trend in psychology, or to a peculiar philosophical theory of the mind, so that one might still be a behaviorist without committing oneself to the view that the mind is nothing but behavior, and without interpreting behavior itself in any mechanistic sense.

But the question still remains unanswered what the philosophical implications will be if we consider the mind as essentially behavior. To what extent does this view threaten to impair the reality, dignity and spiritual worth of the mind? What would happen to our conception of personality, of the self, the ego, the soul, if such a view should prevail? What would be the ethical and social consequences of such a view? It is important to ask and to try to answer these questions, since it would be most unfortunate if there should be a conflict between the scientific notion of the mind as held by psychologists on the one hand and the theory of the mind prevailing in philosophy, religion, ethics and social science on the other. Philosophy and religion must never again be divorced from science.

Let us then consider here the question whether, if

the mind should prove to be, either in whole or in part, behavior, this would detract from its reality or its dignity. Possibly we shall find that it detracts from neither but strengthens both. The popular view that spirit has been materialized by contemporary science is less true than that matter has been spiritualized, but neither of these propositions would have any significance until the words matter and spirit have been more carefully defined.

The first step in clearing up the situation is to unlearn our lesson of the nineteenth century that the *real* things of the world are certain so-called entities, such as inert and passive matter, or the motion of such matter in space, while the situations and phenomena of our daily sensuous experience are in some way derived and secondary. Matter and motion, it was said, are the real things in the world, while life and mind are secondary and derived. They are not real; they are merely forms, functions or movements of the real. This is the lesson which we have to unlearn.

In the first place, there are no inert and passive atoms or elements, and, in the second place, reality is found not alone in elements, but in happenings and events and in the qualities, powers and activities which proceed from structure. The things which we can *do* are more real and more important than the elements out of which we are made.

Nineteenth-Century Elementalism

The nineteenth century, intrigued by the new power of analysis which science had discovered, made the mistake of supposing that the newly discovered "elements," such as molecules and atoms and, later, protons and electrons, were the realities of the world, and that the sensible objects and phenomena of our daily experience were derived and secondary. It did not occur to the investigators of the last century that perhaps the real things are the concrete situations to be analyzed rather than the abstractions which result from the analysis. Although they themselves were the discoverers of the principle of evolution, they failed to grasp the real significance of evolution, namely, the significance of new structures, new complexes, and the new properties and capacities emerging therefrom. Their gaze was fixed upon elements rather than upon structural wholes. They overlooked the fact that the interests of Nature are not with elements but with wholes. Wholes are the real units of Nature.[1]

Living organisms are for us the most interesting examples of such wholes. The living being represents at once the emergence of an actuality of a high order and, at the same time, a unitary complex from which there spring even more wonderful actualities, such as

[1] Compare the illuminating account in Gen. Smuts' *Holism and Evolution.*

growth, reproduction, self-preservation, instinctive and adaptive behavior, personality and conscious control of the forces of nature. The human organism is no aggregate of elements but an organization, a focus of time and space relations connecting it with both the past and the future, and making it the centre of creative powers.

We may leave for a moment the consideration of this all-important subject of structure and creative synthesis and return to the lesser subject of elements, which still seems to interest most people. Let us begin with the atoms. Atoms were formerly considered to be fixed entities, the stuff out of which the world is made. In Grecian days Democritus pictured them as minute, imperishable particles colliding and combining to form whatever things may be in nature or in mind. The nineteenth century, while picturing the atoms in a different way, still thought of them as the final material of the universe. There were somewhat more than eighty different kinds of them, but the atoms themselves were unresolvable and indestructible, the bricks of which the cosmic structure is built. They were things, not processes.

But the twentieth century has discovered that the atoms are not substances but organizations, whose qualities depend upon their structure, or upon their organiz-

ing relations. They are resolvable into simpler units called protons and electrons. The atom, therefore, is no longer thought of as a bit of matter, as a particle of stuff, or a fixed entity in the older meaning of these terms. It is a complicated structure of simpler elements and is sometimes called an energy system. It is not a substance, nor is it inert and passive matter. If we speak of it as matter, the latter word has lost its former meaning. We know less about the structure of atoms than we did a few years ago—atoms, it appears, *are* what they *do*.

> Matter like life is intensely active, indeed is Action in the technical physical sense; the difference is not between deadness and activity, but between two different kinds of activity. Through their common activities the fields of matter and life thus overlap and intermingle, and absolute separation disappears.[1]

As regards the protons and electrons, finding that they behave electrically, we might for the moment conclude that electricity is the "stuff" of the world, only to find that it does not answer to our notion of stuff. Shall we then call it a form of energy? That our material universe is ultimately reducible to energy has been for many years a favorite doctrine among some philoso-

[1] General J. C. Smuts, *Holism and Evolution*, p. 36. The Macmillan Company.

phers. A more careful analysis seems, however, to give us little encouragement in reducing either the physical or the mental world to energy. Energy, as commonly defined, is the capacity for doing work; but a capacity is only a process which can do something. Its measurable character leads us to call it energy. More strictly, in Mr. Whitehead's words, "energy is merely the name for the quantitative aspect of a structure of happenings; in short, it depends on the notion of the functioning of an organism." [1]

It appears, therefore, that the physical world is to be reduced neither to matter nor to energy, but to activity, process, happenings. There seems to be no final atomism in the sense in which this term has commonly been used, or if there are final atoms they are "atoms of action," as suggested by the quantum theory. If, then, any one should still wish to regard the *elements* of the world as in some sense more *real* than the structures which we analyze into elements, it will be

[1] Alfred North Whitehead, *Science and the Modern World,* p. 144. In this connection the following quotation from the recent work of Professor Bridgman is instructive.

"The general conclusion to which all this discussion leads is that energy is probably not entitled to the fundamental position that physical thought is inclined to give it, but that it is a more or less incidental consequence of more deep-seated properties, and that the character of these deep-seated properties is subject to only the most general restrictions, so that very little about the nature of the details can be inferred from the existence of any energy function." P. W. Bridgman, *The Logic of Modern Physics,* p. 117. The Macmillan Company.

interesting to such a one to learn that the essential nature of the elements, so far as our analysis goes at present, is activity, or behavior, the very thing which we have found the mind to be.

Lately the mathematicians have made startling contributions to the nature of reality. Time and space seem to be more intimately related than we formerly believed. There seems to be little evidence of any material particles existing in a spaceless time or moving in a timeless space. We are therefore led back to the *event* as the ultimate reality. The event, as Mr. Whitehead explains, is the emergence of something into actuality. All the world movement may indeed be regarded as an "emergence into actuality." "The general aspect of nature is that of evolutionary expansiveness." [1]

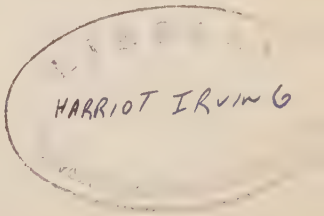
Such a conception of nature and of evolution is most impressive. We may think of all the steps in evolution as emergence into actuality, the human mind being, so far as we know at present, the emergence of a final and most perfect actuality. Or, if, with the mathematicians, we wish to use the word *event* as applying to something more ultimate than the atom or the electron, then we may think also of the mind as the great event in the progress of evolution.

[1] Whitehead, *Science and the Modern World*, p. 136.

It appears, then, as the result of the foregoing analysis, that the mind has not lost any of its reality by the discovery that it is an activity or form of behavior, since thereby it partakes of the very nature of reality.

The Philosophy of Organisms

We are in position now to answer some of the old perplexing questions about the mind. If it is a form of behavior or an activity of the organism, and if the organism is composed of material atoms in motion, then is not the mind itself merely a form of motion or perhaps a form of matter? But the question implies a misunderstanding of the relation of the mind to the body and of the meaning of matter and motion in the science of the present. In the first place, if there are any ultimate elements of the physical world, they are not what we think of as material atoms but atoms of action, activities or events. They are the emergence of something into actuality. They are perhaps themselves organisms. The organismic view of nature is coming more and more to prevail over the older mechanistic view. "Science," as Mr. Whitehead says, "is taking on a new aspect which is neither purely physical, nor purely biological. It is becoming the study of organisms. Biology is the study of the larger organ-



isms; whereas physics is the study of the smaller organisms." [1]

In the second place, since mind is a form of activity of an organism, the significant thing in the situation is the organism itself and not the elements of which it is composed, be they material atoms, atoms of action, or other organisms, for the properties of an organism are not the same as the properties of the elements of which it is composed. An organism is a unitary complex. By this is meant a complex which itself behaves as a unit and in which all the parts are influenced by the pattern of the whole.[2] Every such complex has its characteristic reaction or mode of activity, and these reactions constitute what we know as the properties of the organism, not necessarily resembling in any way the properties of its elements. The properties of common salt, for instance, could never be deduced from the properties of sodium and chlorine, the elements of which it is composed. From the latter, we should infer that salt would be a corrosive poison rather than an agreeable seasoning for our food.

Protons and electrons are organized in the form of atoms. Atoms are unitary complexes whose properties are wholly different from the properties of protons and electrons. A synthesis takes place which is called crea-

[1] *Science and the Modern World,* p. 145.

[2] Compare the interesting discussion of unitary complexes in Eno's *Activism,* Chapter V.

tive synthesis, inasmuch as something new appears as a result of the synthesis. The fullest knowledge of the properties of protons and electrons would not reveal the properties of the atoms composed of them. These must be determined experimentally.[1] The properties of atoms depend upon the form of organization of the protons and electrons as well as upon the properties of the latter, and these properties themselves may be different as related in the atom from what they are by themselves. A sort of analogy may be found in the behavior of an individual by himself and the same individual in a crowd. You may know a man and his whole life history but you cannot tell how he will behave in a crowd until you see him in a crowd. A and B integrated are more than A and B added. The relations of elements in organisms are organic, not additive.

Atoms, again, are organized into molecules, the molecules having properties wholly different from those of their constituent atoms. Oxygen and hydrogen are organized into a molecule of water. Water quenches thirst, revives the drooping plant, freezes at zero Centigrade, but oxygen and hydrogen do none of these things. The most complete knowledge of oxygen and hydrogen either by themselves or in other compounds would not reveal in advance what the properties of

[1] Compare H. S. Jennings, "Diverse Doctrines of Evolution, Their Relation to the Practice of Science and of Life" in *Science*, Jan. 14, 1927, pp. 19-25.

water will be, and yet the quenching of thirst, the watering of a plant or tree, the freezing at a certain temperature, are real qualities helping to make our real world what it is, and indeed determining what the real world of the future is to be.

A molecule of water is quite a simple affair, but some molecules like those of the colloids are tremendously complex and have remarkable qualities. Finally we have the living cell, a highly complex organism composed of highly complex molecules. With the appearance of living matter there emerges a whole series of marvelous new powers such as metabolism, growth, self-preservation and reproduction. Living cells are organized into animal structures, ranging from the simplest sponges to the almost infinitely complex human body. Even single-celled organisms, like the amœba, exhibit their characteristic reactions. They move and breathe and feed and discriminate between objects to be avoided or embraced; while the very highest, the human being, exhibits his characteristic reactions in intelligent and adaptive behavior, memory, imagination, abstract thought, and social organization.

As compared with an atom of hydrogen, an atom of radium or uranium seems very complex. As compared with a molecule of water, a molecule of the organic colloids seems very complex. But all of these seem like simple affairs if we compare them with the almost

infinite complexity of the human body, with its more than nine thousand million neurones in the brain alone, with their countless possible synaptic connections, so that we need not be surprised that powers should spring therefrom comparable with thought, intelligence, and reasoning.

This law of creative synthesis is one of the important contributions of modern philosophy. Further reference to it will be made in the chapters which follow when we are discussing the evolution of mind and the relation of mind and body. It is closely related to the organicist view of nature and the theory of levels and of emergent evolution.[1] Nothing has done so much to heal the ancient differences between the idealist and the materialist and between the vitalist and the mechanist. Even the old controversy about freedom

[1] Compare William Morton Wheeler, *Emergent Evolution and the Development of Societies,* New York, 1928. This instructive little book contains a clear statement of the theory of emergence with a brief historical review. Compare also the book by C. Lloyd Morgan, entitled *Emergent Evolution,* and the interesting article by H. S. Jennings entitled "Diverse Doctrines of Evolution," in *Science,* Jan. 14, 1927.

On the theory of emergence in its logical aspects compare Arthur O. Lovejoy, "The Meaning of Emergence and Its Modes." *Jour. Phil. Studies,* Vol. II, No. 6.

On the theory of levels, compare Roy Wood Sellars, *Evolutionary Naturalism,* Chapter XV and *The Principles and Problems of Philosophy,* Chapter XXIV, and George P. Conger, "The Doctrine of Levels," *Jour. Phil.,* Vol. XXII, No. 12.

On mind as an emergent quality compare S. Alexander, *Space, Time and Deity,* Vol. II, book 3, Chapter I, and C. D. Broad, *Mind and Its Place in Nature,* Chapters II & XIV.

and determinism appears much softened from this point of view.

As a result of this new method of interpreting nature, we are coming to understand how things may be *real* without being original, how the most wonderful of realities may come into being as the result of creative synthesis, how *structural* arrangement issues in new powers and capacities through which nature attains its successive levels. It appears that nature is a kind of blossoming out process in which organic life, intelligence, spoken and written language, reflective thinking, constructive imagination, artistic creation, social organization, commercial enterprise, and moral progress are successive steps *realized* in a process of development. It is not necessary in order to account for life and mind to read them back into the beginning of things. Neither is it necessary to invent "entelechies" or "vital forces" to work in some mystical manner upon material things. Nor, finally, is it necessary to say that life and mind are just mysteries or supernatural essences which defy any explanation whatever. They are the characteristic reactions of unitary complexes of a high order. As Aristotle said, plants can grow, animals can grow and feel and move, men can grow and feel and move and *think.* When man arrives, a new reality is born, namely, thought, and because of thought, memory, reasoning,

and imagination, the world immediately becomes different. They are not by-products of processes essentially material; they are the realities of the world, and they themselves determine the course of the future development of the world.

Is Mind a Function of the Body?

Another thing which needs clearing up is the meaning of the word *function.* If mind is behavior, is it not just a function of the body or the brain, and therefore something secondary or subordinate? Or if mind is a form of activity, is it not functional activity and therefore different from the activity which we have described? The word *function* in science has two meanings. Its first and common meaning refers to the peculiar office or work properly belonging to or assigned to any organ or part of a larger whole. Thus in the economy of the tree, the leaves, root, and bark have each their peculiar function. In the economy of the human body each organ has its function. The function of the stomach is to receive and digest food. The function of the endocrine glands is to regulate behavior by means of certain activating secretions or hormones, which poured into the bloodstream produce certain useful effects. The function of the brain is to receive, mediate, and transmit nerve impulses. In a

given social community, the function of the lawyer, judge, legislator, treasurer, is to perform the duties pertaining to his peculiar office.

Now in this sense of the word it is not the function of a tree to grow, bear fruit and reproduce its kind, nor is it the function of a man to think, reflect or reason. But there is another meaning of the word according to which function means the specific power or mode of activity of any organism as a whole or any agent or individual. In this sense, it *is* the function of a tree to grow, and of a man to think, of an artist to paint pictures and of a composer to produce oratorios. In this sense, the function of anything is not what it has to do as a part of some machine or larger organism, but what it *can* do in its own free creative activity. It is its end or fruition.

We see then that mind is not matter in motion, and not a function of the brain. It is the characteristic activity of a unitary complex of an exceedingly high order. It is not a function of any organ or set of organs in the body but an activity of the individual as a whole in interaction with his physical and social environment. The total of reality is constantly enlarged and enriched by the new qualities and new modes of behavior which arise from the organization of elements or complexes of a lower grade into com-

plexes of a higher grade. The human mind is such an enlargement and enrichment of reality, and cannot be analyzed back into any combination of physical or physiological elements.

We have come thus to understand something of the place and significance of mind in its relation to other events in the world. Clearly it occupies a place of honor among all those events and activities which make up the world described by science. In dignity and value it would seem to be above them all. One might indeed adopt the Aristotelian notion of the world as a great process of realization, in which mind is not a fixed and finished entity, but rather an ideal value which has at last been realized.

And, indeed, is this view of the mind so very different from that of Plato, which, as we have seen, has fascinated so many lovers of truth? Plato believed that the soul is a kind of divine essence come from God. But we have learned that "essence" is activity, and that the soul is an activity, not a finished thing possessing faculties, but the ideal functioning of a living being —an achievement, if not a goal—which Creative Effort has realized through an age-long evolutionary movement.

CHAPTER VI

MIND AND BODY

THE mind-body problem comes down to us from very old times, being the cause of much grief to many philosophers early and late. Whole systems of philosophy have been devised, aimed primarily at the solution or avoidance of this problem. And yet it is largely a pseudo-problem, at least in its usual form. We begin by creating a dualism of body and mind, the former being considered as composed of inert "matter" with a certain ignoble quality suggesting the flesh and the devil, the latter regarded as some spiritual substance or psychical entity, or else as some kind of consciousness, whose essential being makes it wholly incommensurable with a material body. This mind and this body must somehow interact, for do we not see the mind working upon the body momentarily and in countless ways, as when by an act of will I move my limbs; and likewise the body acting upon the mind, as when a drug absorbed by the digestive system quickens or dulls the intellect? But since body is body and mind is mind, how can they act one upon the other? Vast labor has

been expended in trying to solve this puzzle and libraries have been filled with books about it.

Or perhaps we invent another dualism between the "internal" and the "external" world, the latter being the world of physical bodies, the former, an inner sanctuary, adorned with all our mental furniture. But here also perhaps the difficulties are of our own making. Perhaps this dualism also does not exist. As Woodbridge says, "We court only confusion if we conceive the external world to be a place where perceiving, remembering, imagining, hoping, fearing, loving, hating, and thinking do not take place and then invent another world where these events occur. With two such worlds we are never at peace. The supposition of them has never added a genuine increment to our knowledge. We may make it, but we must needs straightway forget it when we set to work describing and explaining the one world in which we live." [1]

To be sure the problem of interaction in general is full enough of difficulties. A professor of philosophy can draw upon the blackboard a picture of two billiard balls and demonstrate to his bewildered hearers that the balls cannot interact, and that motion cannot be communicated from one to the other. In the last analysis we do not know how one atom acts upon its neigh-

[1] Frederick J. E. Woodbridge, *The Realm of Mind*, pp. 121, 122. Columbia Univ. Press.

bor or how the electrons interact. But possibly the mind-body problem does not present a case of interaction. This bridge we do not need to cross until we come to it. One thing at any rate is sure, and this is that the problem of mind and body becomes greatly simplified as soon as we begin to regard the mind as the name of a certain class of activities of a living being.

Classical Theories

But first it will be necessary to glance at the typical classical theories of the mind-body relation, stating these briefly with only passing criticisms.

It was in the seventeenth century in the time of Descartes that the mind-body problem became acute. Descartes considered that the lower animals were just machines, having no minds. They move about, they feed, they are acted upon by their environment, they react to it, and in all this no difficulty is found. But man differs from the animals in having a soul as well as a body, the former being pure thought, the latter pure extension.

Descartes lived in the years of the dawning sciences of physics and dynamics, when matter was regarded as that extended stuff which embodies the fundamental laws of inertia. But the soul, he said, is something wholly and absolutely different from matter. It is an unextended, spiritual and immortal substance. It re-

sides in the body and may even be located at a certain point in the brain. But obviously this soul interacts with the body and since they have no attribute in common, how could they? Descartes made some fanciful and curious attempts to mediate between mind and body, as for instance in his theory of "animal spirits," but the problem unsolved was bequeathed to his successors.

Nevertheless Descartes' theory of the relation between mind and body has come down to us as a type of the interaction theories. All these have this in common, that they affirm an essential difference between mind and body and yet declare that these mutually interact, even although it is difficult to understand how this could be, and even although such interaction appears to come into conflict with the law of conservation of energy.

The solution proposed by Descartes' immediate successors revealed the truly desperate character of the problem, for the Occasionalists suggested that there is really no interaction between body and mind, an act of will being the *occasion,* not the cause, of the movement of the limbs, the real cause of the latter being the omnipotent power of God.

Historically more important was the view proposed by the philosopher Spinoza, Descartes' most distin-

guished successor. Spinoza is ranked as one of the great philosophers of history, his distinction arising perhaps more from his ethical theories and his veiled Naturalism than from any fruitful contribution to the philosophy of mind. With him the Cartesian dualism becomes a pantheistic monism, affirming that reality is found not in two substances, such as thought and extension, but in one substance, God; and God is known to us under two attributes, which are *thought* and *extension.* Here is the wonder key which was to unlock the secret of the old mind-body puzzle. No longer are there two substances to interact, and yet the distinction of mind and body is retained. They are two aspects of the one universal being. They are two points of view of the same reality. There is only one shield in Achilles' hand but it is convex and concave at the same time. There is only one reality in the universe but it is at once mind and matter. The circle and the idea of the circle are the same.

This is the celebrated double-aspect theory of mind and body and it is safe to say that nothing in the history of theories is so well adapted to befuddle the student of philosophy or bewilder the searcher after truth. It sounds reasonable only when you take refuge in some figure, like that of the shield, and do not stop to question its application to the problem in hand. So far as the latter is concerned, Spinoza's theory is merely an

explanation in words. The relation between mind and body is not explained by saying that each one is related to a third thing as attribute. Spinoza defines attribute as "that which intellect sees in substance as constituting its essence." If that means anything to anyone now, it would at least appear that it throws no light upon the mind-body problem, for an "essential" difference would still remain. Descartes attempted to solve his dualism of mind and body by inserting between them the mythical "animal spirits"; Spinoza, by asserting the equally mythical "substance." Not content with that, he presumes to call this substance God. But God has a real and definite meaning to most of us, and what this word means to us is certainly not substance.

The great German thinker, Leibniz, followed Spinoza, but he could not accept Spinoza's substance and attribute philosophy. It was quite too static for this dynamic world of ours. Leibniz believed that the whole universe is composed of units, or atoms, which he called Monads. We recall his interesting monad theory. Unlike the atoms of those days, the monads are non-material units of reality. They are psychical beings, centres of force and activity. They are little souls. What we call matter is composed of monads in various kinds of grouping and in various degrees of devel-

opment. Thus all reality is spiritual, and it appears at first that there is no mind-body problem, for all is mind. But the soul is one individual monad and the body is made up of others. Hence the problem of how the soul monad interacts with the body monads is the old problem in a new form. Leibniz solves this by his celebrated theory of pre-established harmony. Mind and body do not interact, but there is a step-by-step correspondence between the two series, because of a kind of divine harmony pre-established from the beginning. The solution seems as violent as that of the Occasionalists, and appears to be the weakest point in an otherwise powerful and suggestive system of philosophy, anticipating modern thought to a greater degree than the work of Spinoza and Descartes.

Another well-known theory of the relation of mind and body is that of Epiphenomenalism. This is a hard-sounding word, but it is practically equivalent to what we know as materialism. The mind-body problem disappears because there is no reality except body. This general view has passed through several stages, the earliest being that of Democritus, who thought that the world is composed of material atoms, the mind consisting of smoother and more nimble ones. Later, in the eighteenth century, certain philosophers said that brain secretes thought. Still later it was said simply

that mind is a function of the brain. Later still it was held that all reality is material and every series of happenings a mechanical series, representing a regular succession of physical causes and effects. But in the case of the living body, mind appears as an *epiphenomenon,* that is, as we might say, something over and above, something extra, a kind of afterglow, or functionless attendant of the physical processes, having itself no effective quality. It is as useless as the blush on the face, and as ineffective as one's shadow.

But it would seem difficult for any epiphenomenalist to deny the efficacy of mind in the world. It seems to be the most potent thing in history. In the past century it has made the world over and promises to remodel it again in the not distant future. It seems difficult to understand how anyone could say that *inventiveness* and *reflective thinking* have no efficacy in the physical world or how human *desire* could have no effect in the world of economics. Clearly the epiphenomenalist is speaking of something else than mind in the sense of thought, intelligence, memory, desire. Perhaps he is speaking of consciousness in the sense of awareness. A man's eloquence might not be much affected by his awareness of it, nor an athlete's speed by his consciousness of it, although even this is doubtful.

The last of the old theories of the mind-body relation which we wish to mention is the one called psychical monism. This, like the theory just discussed, attempts to avoid the mind-body difficulty by denying the reality of one of the factors; only now it is the physical body whose reality is questioned. Mind is the only real thing, the body being a phenomenon or appearance. It is the way the mind appears to another observer. It is the outward manifestation of an inner psychical being.

This theory has able advocates and has been presented in very engaging ways. It seems, at least to the casual reader, to have ethical and religious advantages over the other views. But it offers serious difficulties. If the human body is just the externalization or manifestation of the mind, it would seem that other physical bodies must be the same. Animal bodies would be the manifestation of the animal mind, and plants, manifestation of the plant mind. If, then, we go back in geological time to a point preceding any terrestrial life, what shall we say of earth, rocks and water? Are they the appearance to some observer of an inner soul-life? The theory, of course, carries us into a kind of panpsychism, which teaches that all physical existence is the outward form of some inner spiritual reality. This is an interesting view, but the evidence for it seems to be slight. Physical and mathe-

matical theories of matter do not seem to be pointing that way.

If we take the theory seriously, the question of course arises as to what the panpsychists mean by the words mind, soul, or spirit, which to them form the inner core of reality. Mind, in common usage, refers to such things as thinking, remembering, planning, devising, loving, hating. These are qualities or attitudes of living beings toward their surroundings. But surely we cannot imagine rocks, earth and minerals doing these things. It must be that when the panpsychists say that the inner being of all things is mind, they mean some general principle of growth and expansion, or some organizing power or evolutionary urge, or some potency of future intelligence. The human body might then be composed of such mind-stuff units. But this would not help us any in dealing with the mind-body relation in living beings.

A Simpler Approach

Such are some of the classical theories dealing with the mind-body problem. They all seem somewhat artificial and strained. Perhaps they are all unnecessary. They try to solve a difficulty which may not exist. They bring body and mind into a sharp contrast, which must somehow be overcome. They assume a psychophysical parallelism which must some-

how be mediated. This psychophysical parallelism, as it is called, has been the source of endless difficulty. Perhaps there is no psychophysical parallelism or anything remotely resembling it. There may be a simpler approach to the whole subject. The view of the mind which is developed in the preceding chapters may provide this simpler approach. We begin with no presupposition of any dualism or any parallelism. We have before us merely the presence of a living being, for instance, a man, and this man is doing something, let us say, thinking. Thinking is a form of activity of a living being—a mental activity. Instead of thinking, we might suppose the living being to be reflecting, planning, devising, attending, remembering, imagining, loving, hating, forming habits or learning from experience. All these are forms of mental activity.

There seems to be nothing very mysterious about this, and no difficult "problem" involved. Looking at the situation in this way, the mind-body problem seems almost to have vanished. Plants bloom, trees bear fruit, animals contrive, men think. But there is no plant-blossom problem, and no tree-fruit problem. There is no interaction, no parallelism, no double aspect. No one would say that only the plant is real, the blossom being an epiphenomenon; nor that only the blossom is real, the plant being the blossom as it appears to

another plant; nor that the blossom and the plant are two aspects of a third underlying reality. The analogy between the blossom and the mind is, of course, not perfect, but this way of presenting the subject will simplify the matter somewhat, and offer an avenue of approach. It will relieve us of thinking of mind and body as parallel, or interacting, or as being two aspects of some third reality. Nor do we need to think of the body as mere appearance, nor of the mind as any form of energy. The figure of parallel lines, however related, is no longer needed or helpful.

Is Mind an Achievement of the Body?

From this new point of view let us see whether we can get a more precise notion of the actual relation of mind and body, for we have seen that both mind and body are real. Our previous studies should help us here. The mind is something which the body achieves, or which is achieved through the body by means of the creative forces of evolution, or as many of us would prefer to say, by Creative Effort. Every upward step in the process of evolution may be regarded as an achievement—the atom, the molecule, the living cell, the organized body, the mind. The conception is pluralistic rather than dualistic or even monistic. There is no magic about the number two. When two are realized, Nature goes on to three and four. The body is real,

the mind is real, society is real, moral distinctions are real.

It may be said that the use of the word *achievement* implies a teleological view of evolution, as though there were some plan or conscious purpose running through it all. There may indeed be such a purposiveness in nature, but in studying the relation of mind to body this need not now be assumed. We use the word *achieve* here in the sense which successive stages in the world's progress are achieved, for instance, the coming of man, the dawn of intelligence and of language, the rise of social institutions and of art, science, and literature.

In this sense we may say that mind is *achieved,* and this is brought about through the organization and integration of vital and neural processes. The body of living organisms is a unitary complex of a very high order, highly organized and integrated. Such a unitary complex displays qualities and modes of behavior unknown to simpler organisms. New qualitative differences arise not possessed by simpler organisms nor by the several elements of which the organisms are composed. From the integration and organization of vital and neural processes in the human body capacities arise for the various forms of mental activity. The mind has been called a "qualitative event." Resourcefulness, intelligent control, reflective thinking are illus-

trations of this qualitative event. With these a new reality has come into the world, mediated, to be sure, by the human body, but none the less an independent form of being, having its own principles and laws, and being itself effective in future developments both in nature and in society. The world is different because of this mental life. "The mental determines what follows as does every other determiner."

> This carries with it a very different outlook on nature and life from that implied by the contrary view. The situation completely changes as to fatalism and materialism. Among the determining factors for the happenings in nature, are those that we call mental. Thought, purpose, ideals, conscience, do alter what happens, that is, a man with an idea behaves diversely from a man without one; just as a man grasping the electrodes of a powerful battery behaves differently from one not connected with the battery. . . . The desires and aspirations of humanity are determiners in the operation of the universe on the same footing with physical determiners.[1]

Emergence

The word *emergent* has sometimes been used to ex-

[1] H. S. Jennings, "Diverse Doctrines of Evolution. Their Relation to the Practice of Science and of Life," in *Science*, Jan. 14, 1927, p. 25.

press this relation of the mind to the body.[1] The word is perhaps not the most fortunate. We might speak of the flower emerging from the plant, but it would probably be interpreted to mean a physical emergence. In a different sense the flower may be said to emerge from the plant. It is a stage in the growth of the plant, signalling beauty, fragrance, grace. The plant may have neither beauty, fragrance or grace, and certainly the elements of which the plant is composed do not have them. But the flower has them. It is the glory of the plant, its perfection.

So in a sense the mind emerges from the body. Intelligence, thought, reflection, reasoning come into being, as do the qualities of the flower. There are many happenings in the world: the mind is the supreme happening, the supreme reality, but it is mediated through the body, and does not thereby suffer any disparagement. It is the fruition of the body, its realization—both its flower and its fruitage. Aristotle calls it the *form* of the body, that is, its idea, its perfection.

We hear such expressions as the life of the spirit. Is there any such life? Certainly, but we must not think of spirit as any ghostlike insubstantial entity. Spirit, soul, and mind are the same; but when we use the word spirit, it is perhaps that we are thinking of the mind

[1] Compare the references to Emergent Evolution in Chapters V and VIII.

under the aspects of its ethical import or its religious aspirations; and when we use the word soul, our emphasis is rather upon feeling and emotion than upon thought, perception and reasoning.

Does, then, man have a soul? No, he *is* a soul. Only when a living being gains the capacity to think, to reflect, to reason, to use language, does it become a man. Man is a "minded" body. Moreover, he loves, hates, hopes, fears, sympathizes and displays other capacities, social, ethical, religious. We may, then, if we like, say that he is *be-souled*—that he becomes a spiritual being. These words, so long abused, so long the cause of controversy, get at last some definite meaning.

Possible Limitation of the Emergent Theory

The conception of the mind as a form of activity simplifies the ancient puzzle of mind and body to such a degree that the modern philosopher seems to be released from a kind of evil dream. He enjoys a feeling of emancipation. There is, however, at least one point not made clear. The proposed solution applies to the forms of mental activity which the word mind commonly connotes, resourcefulness, intelligence, thought, reflection, judgment, reasoning and the like. But it does not at first sight apply to consciousness in the sense of awareness, nor to those animal and human interests

which we have learned to regard as the springs or incentives of action.

The difficulties here may be real but perhaps not so serious as they seem at first. So far as awareness is concerned, we have seen that it is a relation between an organism and its environment. It would seem that a living being might be aware of things about him or of his own activities and behavior without plunging philosophers into perplexity over the relation of mind and body. Awareness is a relation between a living being and the thing of which he is aware. The capacity of having such awareness presents no problem different from that of other capacities, which arise or emerge at certain stages of organic evolution, or of other properties which arise as a product of increased complexity of structure.

As regards interests, impulses and desires, or the instinctive striving which underlies them, we have seen in a former chapter that while they exist and are an aspect of mind, psychology has not yet advanced to a point where there is complete agreement about their origin or nature. If we suppose them to be emergent qualities arising from such organization as issues in life in general—and this is probably the provisionally accepted view in the science of the present—then there is no peculiar mind-body problem here either, or any problem different from that of the molecule of water

which possesses properties different from that of its elements.

If, however, we suppose with McDougall and some of the vitalists that purposive striving is a unique non-physical energy, agent, or agency, animating, or directing living organisms or insinuating itself into them, then to be sure we are confronted with the old problem in a new form. It would seem necessary to fall back, as McDougall does, on some form of interaction. But McDougall himself, as we have seen, finally escapes from this necessity by his theory of monads, which ascribes to every particle or unit or ultimate element of existence a dynamic character, an initial striving *per se*. The body itself would then be a colony or organization of purposive striving units, and this aspect of the mind-body problem would merge itself in the present ultimate problem of both physics and metaphysics, namely, that of the manner in which any ultimate unit of reality, whether proton, electron, event or atom-of-action, affects or influences any other proton, electron, event or atom-of-action.

But it is not necessary to pursue the subject into these metaphysical recesses, unless we are to agree with the vitalists as to the existence of these mysterious agencies or entelechies, which animate or influence living bodies, and the negation of this vitalism happily does not involve us in any mechanistic interpretation of mind.

Again and again in the preceding pages the suggestion has been made that the ancient differences between mechanistic and vitalistic schools have been softened, if not removed, by the recognition of the fact that every new unitary complex issues in qualitative differences, which are not possessed by the elements of these complexes and which could not be inferred from them. Mr. Bertrand Russell states it in this way: "Our knowledge of data contains features of a qualitative sort, which cannot be deduced from the merely mathematical features of the space-time events inferred from data, and yet these abstract mathematical features are all that we can legitimately infer." [1]

This general law may be applied to both vital and mental phenomena. Its application to each of these classes is clearly expressed by Mr. Broad.

> Just as the only way to find out the properties of silver chloride is to study samples of silver chloride, and no amount of study of silver and of clorine taken separately or in other combinations will help us; so the only way to find out the characteristic behaviour of living bodies may be to study living bodies as such. And no amount of knowledge about how the constituents of a living body behave in isolation or in other and non-living

[1] Bertrand Russell, *Philosophy*, p. 284. W. W. Norton and Company, New York.

wholes might suffice to enable us to predict the characteristic behaviour of a living organism. This possibility is perfectly compatible with the view that the characteristic behaviour of a living body is completely determined by the nature and arrangement of the chemical compounds which compose it, in the sense that any whole which is composed of such compounds in such an arrangement will show vital behaviour and that nothing else will do so. We should merely have to recognize, as we had to do in considering a first-order compound like silver chloride, that we are dealing with an *unique* and *irreducible* law; and not with a special case which arises by the substitution of particular values for variables in a more general law, nor with a combination of several more general laws.[1]

Mind Does not Belong to an Alien World

In the preceding chapter we have seen how this view, not too happily called the emergent theory of mind, has illumined not only vital but mental phenomena, showing the place of the latter in nature and their relation to the physical body. Entelechies may exist as inde-

[1] C. D. Broad, *The Mind and its Place in Nature*, pp. 67, 68. Harcourt, Brace and Company. Mr. Broad in this book has examined with his usual analytical acumen the seventeen possible theories in regard to the relation of mind and body and believes that the theory of emergence offers promise of the best solution.

pendent realities, but at any rate it is not necessary to drag them in for the purpose of explaining vital phenomena, because the latter may be new qualitative differences which arise from complex structure.

So also with mind. Philosophers have labored long and often to show that there is something in mind which in the very nature of things is lacking in physical events and can neither be gained from them or equated with them, such, for instance, as meaning, value, consciousness, purpose, knowledge of the past and anticipation of the future. As Hocking says in a recent book: "Being in themselves devoid of meaning, physical events lack in particular that kind of intrinsic meaning we call *value.* The world with which physics deals enjoys nothing, plans nothing, pursues nothing: it does solely what it must, without joy, but also without pain; without hope, but also without regret or suffering." [1]

The world of physics, he says, is morally indifferent, but man is not morally indifferent.

All this is quite true, but the conclusion habitually drawn from such statements does not follow. This sharp contrast between mind and body, it is said, can be explained only on the assumption that mind belongs to an alien world. But there is another possibility,

[1] William Ernest Hocking, *The Self, Its Body and Freedom,* p. 43. Yale University Press.

namely, that it belongs, not to an alien world, but to a highly developed and ascending world. Mind is not antithetical to body but superior to it.

That mind is something wholly incommensurable with physical energies and spatial relations has been dwelt upon with wearisome repetition in the history of philosophy. The thought of a square object is not a square thought. There is no way in which mind and body can be equated. All this again is true but the explanation lies not in the direction of any dualism but in that of an ascending series of qualitative differences. What the dualist affirms so valiantly about the wholly unique quality of mind as compared with body is true enough but leads to no dualistic world theory. The same may be affirmed with equal valor about the unique character of vital qualities as compared with those of inorganic matter, and so on down the scale.

If then we need a figure to illustrate the relation of mind and body, let us not think of the parallel lines. Let us rather imagine that the body is a kind of ladder up which Nature climbs to a new reality—the reality of mind. This is the philosophy of hope. Through the body, mind has been made actual. Through mind, science, art, philosophy, social organization and moral progress have been realized. Already we are looking forward to more perfect art and science, a truer phil-

osophy, better social organization, and higher moral ideals. With the Pragmatists, we may think of each stage of the upward way as a new creation. Or, with the Platonists, we may think of it as a copy of some eternal pattern.

CHAPTER VII

THE EVOLUTION OF MIND

THERE are two reasons for concluding the brief account of the mind undertaken in the preceding chapters with some references to mental evolution. The first is that we are trying to gain a clear picture of what the mind is and we have long ago learned that it is impossible to get a clear picture of anything without some knowledge of the way it has grown or developed. Everything now must be studied genetically. The other reason is that to many people the theory that the human mind is the product of long ages of development is in some way derogatory to it. If, however, we discover that evolution is a creative process rather than an unfolding process, we shall see not only that it offers no disparagement of the mind but even that it gives to it a position of exalted value, since it may be regarded as the highest stage attained through a developmental process extending over a period of a billion years.

But we shall not study the evolution of mind in the ordinary way. We shall not attempt to show that such an evolution of mind has taken place—that would now be a gratuitous task. Nor shall we attempt to trace the

evolution of mind in its step-by-step development from its first appearance in the lower animals to its full flowering in the human race. This has been fully done by many other writers whose work is open to all. And indeed some of the stages of this evolution have been mentioned in the earlier chapters of this book.

We have seen how the evolution of mind may be traced through its successive stages, through instinctive and habitual actions, through the slow and wearisome history of the trial and error method of dealing with new and perplexing situations, through the first attempts at adaptive behavior, through the coming of language and the implicit lingual responses which facilitated thinking, on and on during the long centuries to the final self-conscious, rational and reflective life of man. It is a very long story and familiar now to all.

We call it the evolution of mind. We may accept this term, if we understand by the word evolution nothing more than the sequence of a graded series of events in the history of the mind, that is, if we take evolution in its broadest sense as signifying "the history of a system undergoing irreversible change." [1]

How Are the Dignity and Worth of the Mind Affected by the Theory of Evolution?

Later in this chapter we shall undertake a more care-

[1] See Lotka, *Elements of Physical Biology*, Chapter II.

ful analysis of the concept of evolution and shall raise the question whether the word evolution is the best word to characterize the process by which mind has come into the world, or whether this process would be more accurately indicated by some other term.

For the present, however, let us assume the evolution of mind in its commonly accepted sense, and let us refer to the familiar discussion as to whether our respect for the human mind will be lowered by the acknowledgment of its long history of growth. This fear was particularly acute during the decades of the last century after the publication of Darwin's *Descent of Man.* We did not wish to find ourselves related to the ape and the earthworm. We were much ashamed of our animal ancestors. Particularly was it feared that it would be in some way derogatory, if it should be shown that man's mind had arisen by an evolutionary process from the instincts, the impulses, or the reflexes of the lower animals. Human consciousness, it was thought, must be something distinct and underived, something perhaps almost divine. The divine origin of the soul had been taught by Plato, and Plato's was the gospel of hope, while Darwin's was the gospel of despair.

Even Alfred Russel Wallace, the co-discoverer with Darwin of the principle of natural selection, exempted the mind of man from the operation of evolution. And

to very many since Wallace's time it has seemed that, even if we must admit an evolutionary origin for the human body, nothing but special creation will account for the birth of mind with its penetrating insight into the secrets of science, its artistic creative power, its soaring aspirations, and its sublime moral intuitions.

But with the coming of the twentieth century, our point of view has changed. In the first place, notwithstanding our reluctance to include the mind with the body in respect to evolution, more and more has the view of Darwin rather than that of Wallace prevailed; for Darwin believed that the human mind and human morals and institutions were quite as much the products of evolution as the body. Wallace's peculiar notion that the mind is to be exempted is now considered an eccentricity of a nineteenth-century scientist, otherwise most eminent. And the view, that just as the human body is the product of millions of years of evolution, so the mind has slowly evolved from the simplest beginnings, is now a well-established one.

In the second place, the fact that there has been mental as well as bodily evolution no longer seems to detract from either the reality or the dignity of the mind. The theory of the ascent of man by gradual steps from the lower forms of life has added to rather than detracted from our sense of his worth. And the enlarged

vision opened in evolution has strengthened rather than weakened our religious faith and our ethical aspirations. With the poet Watson we have come to believe that "this is our loftiest greatness to have been born so low." The more humble the origin, the greater the victory. Man, the climber, the aspirer, the overcomer, wins our admiration.

The modern, energetic, dynamic point of view has changed our notions about evolution. What we prize now is growth, development, adventure, achievement, conquest. Nothing static, ready-made, unprogressive pleases us. The twentieth century does not find its complacency suffering from Darwin's theory of evolution.

And there is another thing to be remembered here. Although, as we shall see, it is very doubtful whether evolution has explained the mind, nevertheless let us suppose for a moment that it has explained it, what then? There are those who seem to think that a thing suffers some kind of degradation as soon as it is explained. Professor Taylor states this very clearly as follows:

> We need always to be on our guard against the insidious tendency to think that by "explaining" a thing we have "explained it away." When we have shown that something has been produced by

a perhaps slow and imperceptible development, we must not suppose that we have shown the product to be any less real than the factors out of which it has been produced. Thus, suppose we have been successful in tracing back the ancestry of man to ancestors whom he has in common with the "anthropoids," or with the vertebrates, or even with a still wider range of living types, for example, "multi-cellular organisms." Our success does not in the least alter the fact that you and I are men and not mere "anthropoids" or vertebrates or "multi-cellular organisms." The differences between ourselves and our nearer or remoter relations are just as real and significant as the fact of the common ancestry. As Butler wrote long ago, "everything is itself and not another thing," not, we may add, by way of comment, its own remote ancestors.[1]

Does the Evolution of Mind Imply a Humble Origin?

The above probably reflects the attitude of most thinking people at the present time. The doctrine of the evolution of mind has been accepted and nothing very terrible has happened. For our purpose, however, interested as we are in finding out what the mind is,

[1] A. E. Taylor, "Philosophy," Chap. XII, p. 455, in *Evolution in the Light of Modern Knowledge*. Reproduced by permission of Blackie and Son, Ltd., London.

we must study the meaning of evolution a little more carefully. There are several questions which press for answer. What is the status at the present day of Darwin's theory of mental evolution? If it is acceptable, does it actually teach that the mind of man has a humble origin? If it does so teach, and if the theory is to prevail, what is the impetus through which the mind has risen from its humble origin to its present degree of eminence? If man has fought his way up against some kind of handicap, what has been the aspiring cause? If, on the other hand, Darwin's theory is to be superseded, what other theories of mental evolution are at present in the field?

The future may answer all these questions. Just at present some reflection upon them will be useful. Let us review critically for a moment Darwin's general theory. It was designed to show the origin of animal species, that is, the *manner* of evolution, not its causes. Its causes were unknown to Darwin and remain unknown to the present day. It is only in the popular mind that the theory of natural selection reveals the causes of evolution. Selection rests upon three fundamental principles, namely, the struggle for existence, variation, and heredity. If we grant these, why then, as Darwin thought, we can understand the *manner* of evolution, because natural selection acts to preserve favorable variations.

But how do there come to be favorable variations or any variations? And what is the explanation of heredity, and how does it happen that there is a struggle for existence? It was no part of Darwin's purpose to try to answer any of these questions, except only to say that the struggle for existence flows from the fact of geometrical increase. But why is there geometrical increase or any increase? It is just another way of saying that life is insurgent, and that is just another way of saying that it is life.

The case is no better with the second great principle, that of heredity. We have learned a little about the mechanism of heredity. We have seen something of the microscopic marvel of the germ cell and we understand by means of Mendel's laws something of the way so-called unit characters are distributed in the offspring, but we have not solved the mystery of heredity, nor perhaps made any progress in solving it. Why the child resembles the parent is not made any clearer by observing similar resemblances in the division of the cell. We can count the chromosomes and see them divide and the halves develop into wholes. But we do not know why the developed halves resemble the original wholes. Heredity is resemblance.

Biologists, in explaining to an audience the continuity of the germ plasm, really do not intend to convey

the impression that this explains heredity, although they are often so understood. "In development," says Weismann, "a part of the germ plasm (*i.e.*, the essential germinal material) contained in the parent egg-cell is not used up in the construction of the body of the offspring but is reserved unchanged for the formation of the germcells of the following generation." The unwary reader might wrongly conclude from this that the mystery of heredity is explained, since the germ plasm is actually immortal, transmitted from generation to generation. But since a single cod may lay six million eggs, it is not, of course, the *same* germ plasm that is transmitted, but *similar*. In other words, the cells are constantly multiplying and the new ones resemble the old. It is only the form that is the same from generation to generation, and identity of form is merely another name for heredity. We do not know the causes of heredity, as we do not know the causes of the struggle for existence. Neither do we know the causes of variations, as Darwin himself so explicitly stated.

Again, those who have not thought seriously about evolution sometimes regard natural selection as some kind of cause or agency explaining evolution. The word selection is unfortunately misleading. It seems to imply some sort of appraisement of values, as if

there were intelligent discrimination. There is, of course, no such appraisement. There is the disappearance of unadapted forms.

"The causes of the evolution of life," as Henry Fairfield Osborn says, "are as mysterious as the law of evolution is certain," [1] or as put by Professor Kellogg, "We are in the curious position of knowing now much more about evolution than was known fifty or sixty years ago, but of feeling much less competent that we know the causes of evolution." [2]

How Has the Darwin Theory Stood the Test of the Years?

It is just here that the last twenty-five years have seen the greatest change, and this change is manifest in the growing disappointment with the Darwinian selection theories. Keeping in mind that Darwinism is merely one of several theories as to the manner in which organic evolution has taken place, we must remember that the growing distrust of the Darwinian hypothesis does not indicate any distrust of the fact of evolution. Darwin's selection theories were most brilliant, ingenious and captivating. They completely won the scientific world, and a quarter of a century ago there were few who doubted their adequacy. In fact, we may say that

[1] *The Origin and Evolution of Life,* p. 9, Charles Scribner's Sons.
[2] Vernon R. Kellogg, "Where Evolution Stands Today," *The New Republic,* April 11, 1923.

there are few biologists today who would belittle Darwin's contribution or cast doubt upon the value of the theory of natural selection. But as a complete description of the method of evolution it is very disappointing and as an explanation it sadly fails. That new species have arisen merely by the natural selection of small random variations is a belief that is far weaker today than twenty-five years ago and appears to be steadily losing ground.[1]

If, however, Darwin's selection theory still constituted a workable hypothesis, then our interest would be immediately transferred to the assumptions upon which the theory depends, namely, the struggle for existence, variation and heredity, none of which is understood. The latter fact does not, of course, in itself weaken the value of Darwin's theory, since the struggle for existence, variation, and heredity are real facts. It only weakens the vast claims that have been made for Darwinism in explaining the present world of living beings, and it should be remembered that Darwin himself made no such vast claims. They are legends which have gradually grown up.

Since the valuable work of DeVries in the study of mutations, the mutation theory has to some extent supplanted Darwin's theory of small variations. Muta-

[1] Compare the excellent review of the present status of evolution theories in the chapter on "Zoology" by Ernest W. MacBride, *Evolution in the Light of Modern Knowledge,* Chapter VI.

tions, or sports, are marked deviations from the normal type. The mere machinery of evolution remains the same as in the Darwinian plan. Mutations that are advantageous in the struggle for existence are preserved by natural selection. If, however, the mutation theory were used to explain the origin of species apart from the Darwinian theory, then the mutation theory could hardly be distinguished from so-called special creation. New species just appear. But if the mutations are simply to take the place of the original small chance variations, then the difficulty in explaining variations is intensified in the case of mutations. Darwin expressed great perplexity as to the cause of variations. What then would he say as to the cause of mutations? As regards the workableness of the mutation theory, it has some advantages over the theory of small variations, although difficulties enough remain. But as for explaining the present world of living beings, it stands just where the Darwinian theory stands, except that the embarrassment which Darwin felt about the cause of variations becomes amazement when we reflect upon the cause of mutations. On the whole, the mutation selection theory as it stands at the present is a very doubtful explanation of the origin of species, that is, of the origin of the species that exist and have survived in nature. Evidence is increasing that mutations are of a pathological character due to germ weakening.

It seems, then, that at the present moment we do not know how animal species have arisen, only that they have. And we do not know how mental evolution has taken place, only that it has. There is little doubt that natural selection has been an important factor in evolution, but it is becoming more and more improbable that the materials upon which natural selection works are the random variations in all directions mentioned by Darwin and still more emphasized by the neo-Darwinians, or the mutations which have been emphasized by other evolutionists. We are coming back more to the view that variations in organisms are due to *habits* formed in response to environment crystallized in the form of inherited structure.[1] But such habits presuppose the striving individual. They presuppose the will-to-live which belongs to all life. This is very similar to the evolutionary theory of Lamarck not wholly repugnant to Darwin himself, though quite so to the neo-Darwinian. This will be important presently when we come to study the deep sources of evolution, which is really a study of the sources of variation, but for the moment we are more concerned with the meaning of evolution as a whole.

The Meaning of Evolution

So let us turn now to an inquiry as to the meaning

[1] Compare Ernest W. McBride, op. cit. Chapter VI.

of evolution, or to the meaning especially of Darwinism as it bears upon our problem. How far does Darwin's view of mental evolution reveal the origin of the mind, and what bearing does it have upon the mind's reality, worth and dignity?

The term evolution has been very much on our tongues in the last seventy-five years. We have been quite enraptured with the word and the idea. The word itself, like the German *Entwickelung,* is euphonic, gliding from the tongue with delightful ease. It is only lately, however, that the concept of evolution has been subjected to any careful analysis.[1]

At the close of the last century and in the beginning of this one, the idea of evolution held almost undisputed sway. It was extended far beyond its original application and applied quite universally.

[1] Such an attempt has been made by H. W. B. Joseph in his small monograph entitled *The Concept of Evolution,* Oxford, 1924, and by A. E. Taylor in Chapter XII of the collective work, *Evolution in the Light of Modern Knowledge.* Compare also Alfred J. Lotka in his *Elements of Physical Biology,* Chapters II, III, IV.

The word evolution was little used by Darwin. He was content to propose a theory to account for the origin of species. In the early part of the 18th century, certain anatomists proposed a "theory of evolution" or preformation, according to which all the parts of a full grown animal were present in microscopic form in the embryo, so that they had only to grow or evolve. This theory, which was indeed a theory of unwrapping, was later given up, but the word *evolution* was resuscitated by Herbert Spencer, who proposed a grandiose theory of inorganic and organic development, to which he gave the name evolution, although etymologically the word did not fit his theory.

We began to hear of inorganic, cosmic, astral, geologic and atomic evolution. Even the "delirious electrons" evolved into atoms, and matter itself was the product of a process of development. Social evolution had already made its appearance, and we learned that the new law applied also to the development of language, ideas, beliefs, the family, the church and the state, and to social and political institutions. In fact, in those days of first enthusiasms it occurred to no one that there is any realm of reality at all excluded from the field of evolution. Nothing is fixed or final; nothing is created; everything just grew.

Out of these enthusiasms there did indeed spring a wonderful new impetus to scientific study as the fruit of the genetic method began to be evident to us. Our understanding of all things was amazingly increased by the knowledge of their genetic relations. But lately the limitations of the evolutionary philosophy have begun to appear. Spencer's identification of progress and evolution first was called in question. Recent postwar history has sobered the optimism which was the heritage of nineteenth-century enthusiasm for the future of humanity, encouraged by the Spencerian Darwinian philosophy. Sociologists began to speak less of societal evolution, and when the phrase was used, it meant usually nothing more than that society changes in a certain orderly manner.

Again, the hypothetical "evolution of matter," according to which the chemical elements may have arisen from some simple protoelement, like hydrogen, turns out when examined to be anything but an evolutionary or unwrapping process. It would be decidedly a building-up process, more like an architectural enterprise in human affairs.

We may question whether either the word evolution or development is the proper word to apply to the series of changes studied by Darwin in the world of living organisms, or to the changes which have taken place in society, or to the successive steps in which mind has appeared in the world. Evolution means unwrapping, unrolling, or unfolding. It is a process in which the implicit is becoming explicit, the potential, actual. There is no evidence that organic evolution is in any sense an unwrapping process. Bateson did indeed once propose such a view. It was not taken seriously and probably was not intended to be. The blankest mystery would attend such a theory. It simply ascribes to the germ some mysterious, innate, almost infinite capacity for development. It solves the riddles of evolution by packing them up into the original germ. It seems "to assume some kind of force or power inherent in the germ which works against obstacles." [1]

What we really know is that there are gradual

[1] Pierce, *The Philosophy of Character*, p. 367.

changes in living forms in the direction of greater specialization and adaptation, usually accompanied by a higher degree of organizaton and relatively greater definiteness and stability. Organization, integration, specialization, and adaptation are fundamental concepts in the process which we call evolution. Such changes are not in any way of the nature of an unwrapping or unrolling process, in which the implicit is becoming explicit. On the contrary, they are distinctly of an epigenetic or upbuilding character. Even the simplest Darwinian variation, much more a mutation, is a real increment, a novelty, a new creation, a veritable plus. The whole movement so brilliantly described by Darwin and his predecessors and successors could more correctly have been called an epigenesis. But this word is forbidding, and besides has a technical meaning in biology debarring it from general use. It conveys, however, the meaning of growing *upon,* not *out of.*

Neither is evolution a process in which the potential is becoming actual. We speak of the evolution of the automobile, but the latest skilled product of the automobile art was not potential in the first crude machine. Every improvement has been a new creation. Suppose that you are building a new house and you describe how the plan has "evolved" in your mind. But the fact is that every change or every addition was a new thought, an improvement, a plus, a creation. The original sim-

ple house plan did not contain any potency of the final perfected scheme.

Evolution a Creative Process

Briefly, then, the meaning of evolution is that it is a creative process, something new appearing at every step of the developmental history. Every change is a transformation. The French word *transformisme* is a happier word than the English *evolution,* or the German *Entwickelung.* The word development, which has been defined as "the revelation of the successive phases of something in which there is a manifest unity," is better than evolution, since it does not connote an unwrapping process, but fails again to carry the notion of a plus or increase. What we call evolution is neither an unwrapping of something, nor is it the mere revelation of a unity. It seems more like a series of surprises, like the invention of air transports, or telephonic speech with Europe.

Tyndall said that in matter he saw the promise and potency of all life. This was mere rhetoric fitted to stir a nineteenth-century audience. Since we do not know the causes of evolution, we do not know of any developmental potency in matter. The only way to support this proposition would be to argue that since all life has come out of matter, it must have been contained potentially in it, where the only authority

for the major premise is the etymological meaning of the word evolution. One might as well say that one sees in oxygen and hydrogen the promise and potency of water and all its forms, or in the behavior of apes the promise and potency of the infinitesimal calculus. Water satisfies thirst, and revives the drooping plant, and freezes at zero Centigrade. But certainly there is no promise of any of these qualities in oxygen and hydrogen. There is something more than oxygen and hydrogen in a molecule of water, namely, a certain peculiar organization with the accompanying characteristic qualities of water.

Evolution is a history of new forms and functions. Every new form is a plus—a new creation. Since Wundt introduced the notion of creative synthesis, the word *creation* is coming into general use both in science and philosophy. Creation does not mean the production of something out of nothing. The architect creates a Gothic cathedral, but he does not create the stone and mortar. The promoter creates a new organization, but he does not create the men that compose it. Creation means just this—the production of something distinctly new and unique. Reality is found, as Aristotle told us long ago, in structure, form, organization and function, not in the mere stuff which happens to compose the material. Organic evolution is essentially constructive and creative.

Objection has sometimes been made to the phrase *creative evolution* because of the theological associations of the phrase and sometimes because it is thought to carry the implication of the whole philosophy of Bergson. There are also obvious logical objections to the union of the two words. Certainly, however, the concept of evolution is enlarged in the right direction by the use of the word creative. Such phrases as *creative synthesis, creative organization,* or as some would say, *creative effort,* would seem to designate the whole process more accurately than evolution. This is seen very clearly when we consider the process sometimes called social evolution. Society does not unroll or evolve; it is changed, enlarged and sometimes perfected by the successive additions of new ideas and institutions, such, for instance, as the cinema, the automobile, aerial transportation, votes for women, the League of Nations, limitation of armaments.

What Then Does Mental Evolution Mean?

So finally we are in position to appraise the meaning of the phrase *mental evolution.* It has been repugnant to some to believe that the mind of man has been evolved from animal behavior. But we see now that mind is not something evolved *out of* animal behavior. The mind of the champanzee was not potential in the simple responses of earlier organisms. When it comes,

it is in the form of new elements added. The reflective power of the human mind is not potential in the crude adaptive actions of the chimpanzee. It is something new and wonderful. Even according to the original Darwinian theory of small variations, every variation is a novelty. As we pass from animal instincts to the human mind, no matter how small the increments or gradual the process, at *some* point in the developmental history an all-wise observer would be obliged to say, "this is no longer animal instinct, it is mind," while according to the mutation theory we may believe that mind more suddenly appeared.

The epigenetic character of mental evolution is well illustrated by language. We have seen what a tremendous advance was made in mind with the advent of language, and what remarkable further progress was made when language became implicit. True speech is not possessed by apes, i. e., words expressive of ideas.[1] Man does possess it. But speech is not implicit in the behavior of apes. It is not the revelation of something hidden. It is not something which needs to be *brought out.* It is something *brought in.* It was not there before, potentially or implicitly. It is a gift—not a debt or obligation of the past to the future. We may recall the experiment of Köhler with the hens in the blind alley pressing reflexly toward the coveted object,

[1] Compare Yerkes, *Almost Human,* p. 180.

and the swift ideational solution of the problem by the little girl. The latter was not potential in the clumsy trial and error method of the hens. It was a gift to the human race.

Thus Darwinism has nothing to teach us concerning either the origin or the nature of mind. It records only the successive unexplained appearance of an unending series of new events, one of which is the great event of mind. If we seek to know the origin of mind, we must go beyond Darwin in some deeper analysis of the process called evolution. It is not an unrolling process. It is not a movement from the potential to the actual. It is useless to define it as genetic continuity, for we have seen that its very essence resides in its discontinuities. It cannot be defined as a series of orderly changes, for as far as the changes are evolutionary, they are disorderly. To define it as a system undergoing irreversible change is accurate but not illuminating. Spencer's definition of evolution as a process of integration and differentiation touches one of its peculiarities, but tells us nothing of its inner nature, and Spencer's celebrated formula, supposed to describe, if not to explain, the whole evolutionary process in nature in all her departments, is now generally believed to be "empty." We know that evolution is integrative, expansive, constructive, epigenetic, creative, formative. It seems to be inventive and imaginative. It *seems*

like a work of creative imagination. It reminds us ever of the imaginative work of the artist. "If we personify Animate Nature," says a modern biologist, "it must at least be as an artist with inexhaustible imaginative resources, with extraordinary mastery of materials." [1]

However attractive it may be to compare evolution with the work of the artist, or to think of it as the product of creative imagination, this is going beyond our present knowledge. So far as we can see at present, evolution is a process of organization, the formation of new unitary complexes, whose characteristic reactions issue in the new qualities, new functions and new activities which mark the steps of evolutionary progress. Provisionally evolution may be defined as a process of organization, tending to increased complexity and integration, and to increased definiteness and stability, issuing evermore in new structures, each with its characteristic reaction, thus giving to the world new qualities, new powers and new modes of action, all leading to increased control and enlarged freedom. The human body is such a new structure and the human mind is such a new power and mode of action.

[1] *The Outline of Science,* ed. by J. Arthur Thomson, vol. III, p. 705, 4 vols. G. P. Putnam's Sons, New York.

CHAPTER VIII

FORMATIVE FORCES

So it comes about that the problem of organization and its cause may be said to be the outstanding problem in philosophy at present and of especial importance to those interested in ultimate questions in the philosophy of mind.

The present chapter will be concerned with a few of the most noted attempts to answer this question. Is organization the result of the chance collisions and combinations of atoms or electrons? Is there, perchance, some organizing agency in nature or an organizing factor? Is mind itself in some sense of the term a constructive, creative agency, as so often has been claimed? If not in nature at large, at least in the organic realm, is there some *élan vital,* or biotic force at work as the creative cause? Or, finally, is the whole problem utterly beyond the scope either of science or philosophy?

At any rate, the problem of evolution centers here, namely, upon the *relatedness* of things, rather than upon the things which are related. The units, which

at any stage are organized into higher complexes, are themselves, so far as we can see, complexes of other units in the level below, and it seems useless to fix our attention upon any peculiar set of units, such as atoms or electrons, or psychons, or monads, and say that these are the *real* entities to which other things are to be *reduced*.

Mechanistic Theories

Let us consider first the suggestion that all organization is fortuitous, the result of chance collisions and configurations of atoms. The neo-Darwinians have in modern times favored this view. Darwin himself did not concern himself with the problem, except insofar as he seemed to endorse Lamarck's theory that evolutionary changes in organisms grew out of the needs and desires of the organisms themselves.

The neo-Darwinians carry the principle of natural selection much further than its discoverers did, making it the sole arbiter of structural and functional changes that endure and regarding all variations as fortuitous. This emphasis gives to evolution a wholly mechanistic aspect and this mechanistic theory is carried over by many neo-Darwinians to cosmic evolution in general, resulting in a strictly physico-chemical world-view.

Darwin, to be sure, spoke of *chance* variations—but he had no idea of promulgating any such extreme mechanistic theory of evolution as that maintained by

his modern followers. By "chance" he meant absence of design in the theological sense, but he did not mean that the variations were without any other cause than the fortuitous reshuffling of material atoms.

The theory that the whole world is the outcome of chance collisions and combinations of atoms is as old as Democritus, but this theory had always encountered a difficulty in explaining the innumerable adaptations in living organisms. Darwin's theory of natural selection was of course most opportune in explaining all such adaptations, and so it came to pass that, although Darwin was no mechanist, this part of his new theory lent great strength to the old mechanistic philosophy of nature, a world-view that has been generally adopted by the neo-Darwinians.

The bearing of this upon our present discussion is obvious. Since so much is now made of organization, and of the formation of new unitary complexes with the various emergent qualities which spring from them, such as intelligence and adaptive behavior, we have in the physico-chemical world-theory *one possible* explanation of organization in general. New unitary complexes arise through the chance collisions, combinations, and permutations of the ultimate units of the physical world—be they atoms, electrons, psychons or monads.

For instance, no matter how chemically complex the molecules in a bit of organic matter may be, it is con-

ceivable that at some time by the laws of chance such a juxtaposition of atoms might occur, just as it is conceivable that a Shakespearian play, cut into letters, spaces and punctuation marks, thoroughly shuffled, and then arranged in a chance order, might, if the experiment were continually repeated, appear again in the perfect original form, with every comma, period and capital letter in its proper place. The laws of chance are supposed to indicate that in unlimited time every possible permutation must occur, those even represented by such highly complex substances as the organic colloids. Life, therefore, originated in this way and, given the first living germs, the mechanistic road is followed through to such highly developed and inconceivably complex organisms as the human body.

This world-view has been very widely held by scientists during the years since Darwin wrote. Among biologists this attitude has perhaps been due not so much to any desire to take sides in metaphysical controversies as to avoid enlisting with the vitalists. Vitalism formerly stood for a wholly mystical theory of life, and tradition has made it a matter of "good form" in biological laboratories to repudiate vitalism of every description. So a kind of physico-chemical tradition has grown up among those whose interests and talents are not so much in philosophy as in the special fields of their own sciences.

To us, studying the philosophy of mind, it is an interesting question how a purely mechanistic world-view, or a purely physico-chemical theory of organisms, would affect the reality, dignity and worth of the mind. Let us suppose that it be true that the orderly world of the present, animal organisms, adaptive behavior, and all that is included in man and mind have originated in this way, namely, by the mere reshuffling of a certain number of so-called material units, what ultimate bearing would this have upon the philosophy of mind? The assumption would be, I suppose, that there would be something disappointing, if not degrading, about such an origin of mind, as if mind could not be mind if it were made by a chance reshuffling of atoms or electrons, the supposition being that it is made out of them. Although atoms and electrons are no longer considered material entities but rather energy systems or atoms of action, nevertheless it cannot be explained too often that mind in any case would not be made out of them. In any new complex, there is something besides the elements standing in the new relations. There are the new relations themselves, and relations, at any rate, are not material things. If we will persist first in thinking of atoms or electrons as inert "material" units, and then wholly ignore the all-important organizing relations, we may persuade ourselves that mind has had a lowly origin. And then

to these errors we may add another in thinking that that which has had a lowly origin is itself lowly.

So it appears that a mechanistic world-theory in the light of present-day knowledge loses much of its former significance. It has no especial terrors. Matter is no longer dead and inert, and in all organisms the most significant thing is not the units but the organization itself and its emergent properties. In other words, a mechanistic world-scheme today is no longer mechanistic in the older sense.

Neither does a physico-chemical theory of organic life have the materialistic significance of former times. Recent writers have shown that purposiveness in the world of living organisms may be quite consistent with a physico-chemical world-theory, and in a former chapter we have shown that the reality and dignity of the mind cannot be called in question by the fact that it is essentially a kind of behavior. If purposiveness remains, values remain. Thought and reason, love and sacrifice, moral and social relations, art and religion all still remain, and morals, art and religion are values in themselves. The mechanist indeed might, so far as one can see, even regard the whole evolutionary movement as a process of achievement of successive levels of value.

The fact is, however, that a purely physico-chemical theory of the world is now less in evidence. Its

strength consisted in first establishing a dualism between physical nature on the one hand and life, mind and purpose on the other, and then attempting to solve the dualism by *reducing* life, mind, and purpose to an aspect of physical nature. But the antithesis itself was gratuitous and is now disappearing. It rested upon two errors, the first being that physical nature is in its elements something *inert* and lifeless and purposeless. As soon as we begin to think of the fundamental realities as physical units *plus* organizing relations, or more accurately still as events, activities and organizing relations, that unhappy dualism between mind and matter is no longer "solved" as formerly by reducing either mind or matter to the other, but is superseded.[1] The second error consisted in thinking of evolution as a process of getting living things *out of* some fundamental reality such as non-living matter, by considering the first as forms or functions of the second. The difficulties begin to disappear when we think of evolution as a series of levels, in which the world of physics with its own special laws is just one level, having no special honor over other levels represented by life, mind, morals and social institutions.

In other words, the *elements* of the physical world, whose behavior among themselves may be expressed

[1] Compare Ralph Barton Perry, *Philosophy of the Recent Past*, pp. 79, 219 et al.

in the laws of physics and chemistry, behave in a different way when they become subject to the rule of organizing relations, for instance, in the sphere of living organisms. No laws of physics and chemistry are violated, but no *complete* account of the behavior of atoms and molecules can be given until these are tested in the new relations in which they find themselves in organisms. The most complete knowledge of the inorganic world would not reveal to us how organisms will behave. The latter must be determined experimentally.

Our error consisted in fixing our attention upon the units or elements of any one level, for instance, that of atoms or electrons, and then trying to reduce the things that follow to them. Atoms and electrons have their characteristic reactions, but so also do the unitary complexes of the next higher order. It has been customary to think of the elements of the inorganic world as being more "honorable" or having some special prerogative, because, as it was thought, life, mind, and society may be reduced to them. But with equal right one might reason that life, mind, and society are the more honorable, since the others are *indispensable* to them. In fact, however, we must be satisfied to fix our attention less upon the elements in any level and more upon the organizing relations.

Still other circumstances have tended to weaken the

prestige of extreme mechanistic world-views. Difficulties have accumulated. We have to account not only for the appearance of highly complex organic compounds but also for their stability. And not only for their stability but also for some trend, or drift, or urge toward greater complexity and new integrations. In general the rise of the new physics, the theory of relativity, the revival of vitalism in biology, the Gestalt psychology, the appearance of orthogenetic theories of evolution, the appeal made by the Freudian psychology, the spread of anti-intellectualistic philosophies, and most of all the lessening confidence in the Darwinian theory of evolution, have all operated to weaken our faith in extreme mechanistic world theories.

Indeed the study of evolution itself seems to indicate some kind of tendency or drift, to use the least question-begging terms, not suggested by the fortuitous configurations of units. Evolution seems more like the action of formative forces struggling for expression, or, as a modern biologist has said, struggling up to freedom.

Leaving now Darwin and the mechanistic neo-Darwinian tradition, let us consider some other systems of evolution or celebrated attempts to solve the problem of organization, the central problem in the philosophy of evolution. Aristotle's bold conception can never

cease to interest the student of evolutionary theories. Lamarck's hypothesis concerning organic evolution is important and has been revived as the defects of Darwinism have become evident. Bergson's creative evolution and Lloyd Morgan's emergent evolution are striking and suggestive world-views, both dealing with many of the problems we are discussing. Perhaps more striking still and less dogmatic are the suggestions emanating from present-day biologists of new and different ways of regarding the whole evolutionary movement. Some of these will be noticed later.

Aristotle

Aristotle's world-view was the product of a mind possessing vast stores of scientific knowledge and the creative imagination of a genius. He uses no word corresponding to our word evolution. He speaks rather of a world movement from the potential to the actual, in which matter is eternally taking on form. But he does not use the word matter in the sense of an elementary stuff, nor does he use the word potential in the sense that it contains within itself the cause of all that follows as actuality, for the Prime Mover, the cause of all movement, is separate from matter. Thus the world process is, as Aristotle thinks, a process of *realization,* in which the formless is taking on form, that is, taking on the characteristic qualities belonging to the par-

ticular idea to be realized. For instance, bricks may be "matter" and house, "the form," where the form means the qualities which make a house a house.

This seems to be Aristotle's way of saying that the structureless takes on structure and the unorganized takes on organization, and from the new structures there arise new characteristic qualities. But the peculiar Aristotelian flavor arises from Aristotle's decided teleology, as if every new structure, every new idea, every new species of plant or animal, represents the realization of an end or value. The mind is thus the entelechy, the end, the fruition of that organization which we call the body. The mind is the reality of the body.

Aristotle's final contribution to evolutionary philosophy is his summary solution of the problem of the organizing agency. This he calls the Prime Mover or God, and the significant fact here is that God acts upon the world not as a cause in our modern scientific sense but in the Greek æsthetic sense of a power which moves by attracting. It is as though the world from the beginning were being *drawn* toward the realization of mind, and of beauty and justice and harmony. But Aristotle is not always clear nor his philosophy always consistent.

Bergson

Bergson, the charming thinker of France, most noted

of moderns in the field of philosophy, calls his book *Creative Evolution.* Does Bergson tell us what evolution is and how mind has evolved? To understand him, it is necessary to free ourselves from modes of thought current in scientific and evolutionary circles. The prerogative sciences are no longer physics and chemistry but biology and psychology. Life is not something which through long ages has been evolved from the world made known to us through physics and chemistry but something primordial and elemental. Reality is not revealed by any of the purely physical sciences. They offer us only a world falsified by the rational and conceptual modes of the intellect. Reality lies deeper and is known to us through the sympathetic intuition of our own life, which interpenetrates this ultimate reality.

Life and consciousness therefore do not need to be *derived* through a process of evolution. They are indeed its sources and springs, evolution itself being only the course which this primordial mind-energy takes when it penetrates and overcomes the resistance of matter. The difficulty which Darwin had in explaining variation, and the difficulty which all systems of evolution have in explaining the upward, progressive and novel character of the world movement, present no obstacle to Bergson, because the very nature of the original vital energy, vital impulse, or *élan vital,* is

that it is free, undetermined and creative. Novelties in nature do not have to be accounted for. They are assumed as part of the very being of reality. The mind of man, so far as it is intellect or thought, may well have arisen in response to his practical needs, but so far as it is pure memory and intuition, it is a part of reality itself.

Has Bergson then anything to offer us who are trying to find out what the mind is and whence it comes, and trying to do this without losing contact with the well-established results of the modern sciences? Will the reader not say, Why, this is just another system of philosophy! It may be true, but how am I, a student of everyday science, to fit such a system into the rest of my knowledge? Bergson's view seems to be just another system of idealism, positing mind to start with, and therefore having no difficulty in explaining its presence here and now.

But is it not possible that, while Bergson's philosophy as a whole may not convince us, he has grasped *some* important truths which we may be able to fit in with the more common views of evolution? We have been asking about the organizing agency, where current systems seem to be wanting. When Bergson speaks of the original energy as movement, action, spontaneity, freedom, and creative power, this seems to be ascribing to it characters which help us frankly to complete the

picture of evolution. We have already found reason to believe that evolution is creative, but failed to understand how it was so. In other words, we do not need any organizing agency to work upon the real world of material atoms, because the latter are not so real as life and movement and spontaneity themselves.

On the other hand, when Bergson speaks of the original reality as mind-energy or consciousness, we feel like saying that he is giving to these terms meanings which divorce them too much from empirical psychology. We see many manifestations of life in the plant and animal world, where we have little ground for assuming the presence of mind or consciousness in the usual sense of these words. If by mind Bergson means what we mean by impulse, will, desire, initiative, purposive striving, his view seems more hopeful.

McDougall

Much the same might be said of McDougall's important contributions to the philosophy of mind and mental evolution.[1] His everlasting contention is that no understanding of the mind or its evolution either in man or the lower animals is possible without the recognition of the fundamental character of *purposive striv-*

[1] See especially McDougall's *Outline of Abnormal Psychology* and his chapter on "Mental Evolution" in the book entitled *Evolution in the Light of Modern Knowledge*, Chapter IX, and his chapter on "Men or Robots" in *Psychologies of 1925*.

ing. He proposes a dynamic, conative, hormic, purposive psychology from first to last. Human and animal conduct is goal-seeking activity and must always be interpreted from that standpoint. Purposive striving he seems to regard as a kind of psychic force. This is a sphere where mechanical laws of cause and effect do not rule. While physical processes seem to conform to the laws of strict determination or mechanistic causation, psychical processes conform to wholly different laws, namely, those of purposeful conscious striving, the seeking of goals and ends. This introduces a dualism which in McDougall's earlier writings took the form of the frank psychological dualism of the soul theory, but which in his more recent works appears somewhat modified. He seems to wish to show that purposive striving is the very essence and substance of the soul, and to give this a philosophical basis he proposes a theory of monads like that of Leibniz.[1]

There are two features in McDougall's philosophy of mind that are of peculiar interest to us, seeking to know what the mind is and how it has been evolved. The first is his insistence that we cannot understand the mind, if we dwell exclusively upon the aspect of adaptive behavior or upon such activities as perception,

[1] Compare his *Outline of Abnormal Psychology.*

thought, reasoning, and intelligence. We must also recognize the instinctive strivings and the deep conative tendencies which are wholly distinct features of the mind itself. If McDougall has become so much interested in this conative aspect of mind that he has failed sometimes to emphasize sufficiently the elements of adaptive and intelligent behavior, nevertheless, this is perhaps no more serious than the failure on the part of other psychologists to give due recognition to the deep springs of conduct.

The other point of interest to us in McDougall's work is his answer to the question of the organizing agency, or the dynamic factors in evolution. He explains that biological science is now much concerned with the problem of the origin of the variations and mutations upon which natural selection is supposed to work and that neo-Darwinian principles give no answer to this problem, nor do they explain the genesis of the novelties of form and function which constitute the successive steps in evolution. Lamarck, to be sure, boldly taught that effort and need on the part of organisms were the cause of the heritable modifications of structure and function which form the ground work of evolution. Although Lamarck's hypothesis is not now in great favor, nevertheless, says McDougall, this is not to rule mind or purposive striving out of the

account as a creative agency. It is the only creative agency of which we have any conception.[1]

Thus to McDougall purposive striving is the evolutionary urge which philosophers have sought. Strictly this applies only to the field of organic life, but in some of his writings, by referring it to the monads themselves, that is, to the ultimate units of all reality, he seems to regard it as a kind of cosmic urge, a primordial reality, an ultimate unanalyzable fact, the inspiring cause in all evolution, whether organic or inorganic.

Lloyd Morgan

No one since Herbert Spencer has attempted so ambitious a philosophy of evolution as C. Lloyd Morgan.[2] His training as a biologist and as a psychologist as well as his philosophical bent well fit him for this task. According to Morgan, mind "emerges" at the mental level as a result of the organization of items of the next lower level, but this emergence is only one case of general emergence throughout the evolutionary program.

> Thus we have certain primitive electronic events, as items of what we may call "stuff," which go

[1] *Mental Evolution,* op. cit., p. 353.

[2] See his *Emergent Evolution,* and his chapter on "Biology" in *Evolution in the Light of Modern Knowledge.*

together in substantial unity (or briefly in "substance") to constitute the atom. Each atom is an orderly cluster of events and such ;clusters, as new and higher items of stuff, go together in a new kind of substantial unity to constitute the molecule. Molecules, as yet more complex items of stuff of higher status, go together to constitute the crystal unit, new in substance, or the inorganic colloidal unit which differs in its mode of substantial unity.

There is thus progressive advance (a) in the complexity of the higher units of stuff, and (b) in that which may be spoken of as richness in substance. The items of stuff as events or clusters of events, are many and are distributed; but the substantial unity in any integral entity is one and indivisible. It pervades the entity as a whole, and ties together by invisible bonds the multifarious items of stuff which, taken severally, are its parts.

So far we have what Sir William Bragg speaks of as different "types of assemblages of matter," at different levels or stages of advance, in the province of abiological inquiry. There seems to be a jump from level to level; and with each jump new properties "emerge" in orderly and determinate progress. Such progress is evolution, in the

sense of the word I accept. I speak of it as "emergent evolution." [1]

Evolution, then, is a series of stages. At each stage, a new form of relatedness supervenes and from this new relatedness something new emerges, and this new reality is effective in determining the "go of events" in the next higher level. It is what we have been calling the formation of unitary complexes, each with its characteristic reaction. Evolution is thus characteristically "jumpy," proceeding with a step-like advance with the sudden appearance of new characters at each step.

As to the cause of the whole evolutionary movement, Morgan very bluntly calls it God, as the *nisus* through whose activity emergents emerge. Sometimes he uses the word Mind or Activity or Spiritual Agency. Since he speaks sometimes of this primary source as a "drawing upwards through Activity existent at a higher level," his philosophy of evolution seems to resemble that of Aristotle.

Some Opinions of Biologists

In conclusion, it is interesting to notice what appears to be a trend in biology to use wholly different terms in explaining the evolution of mind from those char-

[1] C. Lloyd Morgan, *Evolution in the Light of Modern Knowledge*, p. 110. Reproduced by permission of Blackie and Son, Ltd.

acteristic of the Darwinian period. The revival of Lamarck's theory of evolution, as the limitations of Darwinism become more evident, is significant. Lamarck, more than fifty years earlier than the publication of the *Origin of Species,* not only proclaimed the fact of descent, but proposed a theory of it wholly unlike that of natural selection. Environment is constantly modifying structure and these modifications are inherited. But this is not the significant part of Lamarck's theory. The springs of evolution, the driving force, are found in the *endeavor* of the organism as it strives to satisfy its inner needs. This results in habits, which are transmitted in the form of modified structure and stored memories. There is a hormic principle here, as in the theory of McDougall.

> A wholly different turn could be given to the evolutionary hypothesis if it were held that Lamarck, after all, was on the right track, and that, underlying natural selection and the struggle for life, there was a real tendency in organisms themselves to produce higher forms, meaning by higher those that give more scope for intelligence, beauty and love.[1]

A prominent biologist of the present time says that

[1] F. Melian Stawell, in Stawell and Marvin's *The Making of the Western Mind.* Doubleday, Doran and Company.

the "concept of a creative drift from the futile conflict of chaos toward a more stable structural organization and unity is the central idea of evolution, and the general recognition of this phenomenon is the distinguishing characteristic of the scientific and intellectual thought of modern times. Back of all evolutionary processes lies a universal compulsion to constructive action." [1]

The orthogeneticists, following Aristotle, who believed in an inner perfecting principle, think that the evolution of higher from lower forms cannot be explained without the assumption of "a special tendency toward progress." They believe that the lines of evolution are less influenced by climatic and geologic conditions but are slowly moving toward some ideal goal.

Among many workers in the field of biology the impression prevails that evolutionists have failed to take due account of the *historical* idea, the unity of historical development. Just as Ritter has emphasized the unity of the organism as a unique factor in explaining its behavior, and just as the Gestalt psychologists have dwelt upon the significance of the total situation and configuration, so evolution exhibits

[1] William Patten, *The Grand Strategy of Evolution*, p. 44. R. G. Badger.

a unity of idea which the neo-Darwinians have totally failed to appreciate.

> The paleontologists, who work out long series of fossils, bring forward cases of what looks like steady progress in a definite direction. There is a striking absence of what one might call arrows shot at a venture. It looks as if the occurrence of the new were limited by what has gone before, just as the architecture of a building that has been erected determines in some measure the style of any addition. An organic new departure will tend to be more or less congruent with what has been previously established. In post-Darwinian days the element of the fortuitous has shrunk.[1]

There is apparently in evolution "some inner directing principle," some evolutionary urge, some primordial direction and co-ordination of energies necessary to account for the convergence of effects. Some, interested only in organic evolution, speak of a biotic energy,[2] or an "originative impulse within the organism which expresses itself in variation and muta-

[1] "How Darwinism Stands Today." (Quoted by permission from *The Outline of Science,* edited by J. Arthur Thomson, vol. II, p. 371. 4 vols., New York, G. P. Putnam's Sons, 1922.)

[2] Compare Macfarlane, *The Causes and Course of Organic Evolution,* and Benjamin Moore, *The Origin and Nature of Life.*

tion and in all kinds of creative effort and endeavor." [1] Albert P. Mathews, in a striking article on "The Road of Evolution" speaks of the "struggle for freedom" and believes that there is in the primeval slime a capacity which mechanistic science has overlooked. This is the capacity of struggling against the environment.[2]

Eldridge, in his book, *The Organization of Life,* defends a pluralistic view of the world, maintaining that "organizatory factors" are ultimate realities quite as necessary in an evolutionary world as the subphysical entities which are organized, and John Burroughs speaks of an organizing principle. "In organized matter there is, in and behind all this organizing, a developing principle or tendency; the living force is striving towards other forms." [3] The English botanist, Frederick C. Bower, writing on evolution from the standpoint of a botanist and speaking of the most important factors operative in the evolution of living things, mentions as the first of these "the *initiative* present in all life to develop." [4]

From this discussion two conclusions seem to emerge. The first is that there are certain formative forces at

[1] Geddes and Thomson, *Evolution,* Home University Library, p. 202.

[2] *Yale Review,* January, 1922.

[3] *Accepting the Universe,* p. 209.

[4] *Evolution in the Light of Modern Knowledge,* p. 195. The italics are in the original.

work in the world and that organization is the product of these forces and not of chance groupings of inert elements. To these formative forces many names have been given, such as a "tendency in organisms to produce higher forms," "the initiative present in all life to develop," "the evolutionary urge," "the struggle for existence," "organizatory factors," "an organizing agency," "a capacity of struggling against the environment," "an originative impulse within the organism," "a universal compulsion to constructive action." [1]

Many believe that the organizing tendency is not confined to the world of living organisms but is present throughout the whole of nature. Henderson, writing from the standpoint of a chemist, believes that the world is "biocentric." The course of cosmic evolution is seen "to be intimately related to the structure of the living being and to its activities," and reveals a hitherto unrecognized "order," whose laws we are still unable to fathom.[2] Albert P. Mathews, writing from the standpoint of a biologist, believes that the world of living matter is psycho-tropic, tending toward intelligence and mind.[3]

The second conclusion is that these formative forces issue in organisms of higher and higher order, each

[1] These quotations are drawn from biological sources other than vitalistic or animistic writings.

[2] Lawrence J. Henderson. *The Fitness of the Environment*, p. 312.

[3] "The Road of Evolution," *Yale Review*, Jan., 1922.

with new powers, capacities, and qualitative differences, till finally we arrive at that highly organized and highly integrated complex which we call the living human individual, with its capacity for ordered planning and conscious control.

To this ordered planning and conscious control, this intelligent and adaptive behavior, we give the name mind, and this is the daily meaning of the term. Thus mind is apical, not fundamental. That is, it stands at the end, not at the beginning, of the evolutionary process. It is a value realized. But we must not forget that mind in its broadest sense includes also those impulses, interests and purposive strivings which give to life its zest and meaning. Whether these springs of conduct in living organisms are a part of, or perhaps identical with, the formative forces effective through the whole course of nature is a problem for the future.

Finally

The view outlined in the preceding chapters assigns to the mind an exalted place. Philosophically it would not seem to lend itself to a materialistic world theory. Whether it would lend itself to an idealistic theory would depend upon one's type of idealism. It would not be consistent with any theory which regards reality as composed of mind-stuff, for mind is the late outcome of an age-long course of evolution; it is not something

original but something final. If, however, by idealism we mean that the world process is the realization of ideal values, then an idealistic philosophy would be encouraged.

With the coming of the theory of emergent evolution and the organismic view of nature, there is less interest in materialistic and idealistic philosophies. It seems now less probable that nature is a chance assemblage of material atoms, and still less probable that it is an outer manifestation of some inner psychic stuff. It seems more like an organization with inherent tendencies.

It should be clearly understood that the view of the human mind as the characteristic activity of a highly complex and highly integrated human organism imposes no limits upon the powers of the mind, whether we refer to its intellectual achievements on the one hand, or to its moral intuitions, its religious aspirations, and its artistic creations on the other. There is no reason to suppose that any other view would favor the belief in any greater powers. That something wholly unknown, such, for instance, as a metaphysical *psyche,* might possess superior powers is just a habit of thought —a habit not to be encouraged by those devoted to the methods of science.

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